ADDRESSES AND ORIGINAL ARTICLES

THE STUDY OF SYMPTOMS.*

107

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THE clinical appraisement of disease in man is customarily based upon inquiries into personal and family history and environment; the patient's account, both voluntary and elicited, of his own subjective discomforts; an estimate of his physical type and psychological endowments; and a routine examination of his various systems. In cases of doubt or difficulty we may further employ certain instrumental devices such as the electrocardiograph, or invoke the aid of the radiologist, the chemist, or the bacteriologist. Where none can be neglected it would be difficult indeed to say upon which department of such an inquiry we chiefly rely for our opinions. In one case the patient's ancestry or his own previous pathological career may be all important, in another physiognomy, or the physical examination may give the answer to our question. Often a judical analysis of all available information is necessary. In the earlier part of our clinical training it is usual to stress the importance of physical signs, and long hours are properly devoted to perfection in the arts of palpation, percussion, and auscultation. Nevertheless I am persuaded that with the growth of experience pride of place is often given to symptoms—that is to say, to the purely subjective phenomena of disease. Without symptoms patients would not come to us at all. Symptoms are a part of morbid physiology; they express disturbances of function. As a rule, therefore, they precede the development of signs which are but the outward morbid anatomy of the living.

In the first days of practice we are often baffled by the symptoms which our patients describe and sometimes disconcerted when we find so little of an objective nature to support or explain them. As the years go by, however, we begin to understand and to be grateful for symptoms. Again and again we find ourselves making a reasonable diagnosis while we sit and listen to the patient's story or ply him with our questions, before ever his clothes have been removed or a physical sign has been sought. The majority of patients have indeed little to show in the way of physical signs, for these depend upon advanced structural change. But even in serious forms of organic disease in which, sooner or later, definite physical abnormalities become apparent, symptoms may not only be earlier but also more eloquent than signs. They have, therefore, a particular value for the contributions which they make to early diagnosis. And so, on the score of its practical utility alone, I hope you will bear with my attempts to interest you in a subject which might at first seem to be an elementary part of the daily task of all students of medicine.

There is, however, another aspect of symptomatology and that is the attraction which it offers as a study in itself. For many of us the philosophy of medicine, which runs parallel with the art of medicine pursued for humane ends and with a view to "bread and butter," is a perpetual interest. I am sure we should all endeavour to make it so, for the joys of practice are greatly enhanced if we can also gather in our work some of the crumbs of the philosopher or the natural historian.

I shall, therefore, commend to you the study of symptoms for their own sake as well as for the sake of your patients and your professional reputations. I do so the more eagerly because I feel that the subject still suffers neglect in our generation and that it offers a wide field for future research.

I need hardly remind you that there have been many great students of symptoms whose names and the results of whose researches will abide. In our own island Hilton, Ross, Head, and Mackenzie are famous for their inquiries into the problems of pain. I would commend to your reading as an introduction to the whole subject Hilton's "Lectures on Rest and Pain" and Mackenzie's "Symptoms and their Interpretation." Hurst also in his lectures on "The Sensibility of the Alimentary Canal" deals at length with alimentary pain and other disturbances of alimentary sensation and correlates the results of physiological experiment in man with clinical observation. From these writers and many others whose papers are scattered through the journals we may learn something of the methods which have been evolved for studying symptoms.

Methods of Study.

Two important papers appeared last year in the *British Medical Journal*, one by Sir Thomas Lewis entitled Research in Medicine: Its Position and its Needs, and the other by Mr. Wilfred Trotter entitled Observation and Experiment and their use in the Medical Sciences. The first is critical, stimulating, even provocative and makes an appeal on behalf of clinical science as opposed to curative medicine. It suggests that the experimental study of disease in man, as supplementary to the older observational method, must shortly come into its own and appeals for the appointment and endowment of research physicians who shall be relieved of the necessity of practice. The second is an admirable philosophical inquiry into the relative merits and achievements of the observational and the experimental schools. In the biological sciences it is clear that observation and experiment must ever go hand in hand. The great clinical scientists have commonly made u: of both. It is certain that experiment will lscribe fuller part in the future, but observatior Even continue to make its steady contributions t present ledge. It should be our continual concern and the better observers and better experimence than the it is obvious that only a minority eneral sensations means, the aptitude, or the oppy accompany it. for the life of the experimenter. Tharious ways in continue to enter practice in one form or sitive than every one of these must do his best to ected than observer, or in fact a physician—a student of thought nature, for this (as Prof. Gairdner† so aptly induce many years ago) was the original interpretation di- the word. The more correctly he observes and the more carefully he sifts and records his observations the better practitioner will he be, and the more likely is it that he will render useful service to clinical science. There is no subject that he will have better opportunities of studying than the subject of symptomatology, for he will live in the midst of symptoms. It will, I think, be a very long time before symptoms can be studied experimentally

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* An address delivered before the Glasgow University Medico-Chirurgical Society on Jan. 22nd.

† The Physician as Naturalist. Glasgow. 1888.

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on any considerable scale. Very few of them can be accurately reproduced. The majority of them as they occur in nature are transient. We have no practical method at present of measuring or photographing subjective phenomena. They express the behaviour of diseased or disordered tissues, and like the behaviour of plants and animals we are likely to learn more about them by constant and close observation, by careful recording, and by correlation of these observations with objective phenomena and existing physiological knowledge than by any other process of study.

If we pause for a moment to think of such familiar symptoms as pain and dyspnœa we realise at once that, while our intimate knowledge is slight, we can already classify them into several varieties of pain and dyspnœa and that in certain instances a particular variety has a very special significance. When it has a special clinical significance it also has a special physiological significance, and the actual mechanism of the pain or the chemistry of the breathlessness in such case has commonly been proved. In time it should be possible to sift and classify and analyse all the subjective phenomena of disease in the same way, and the meaning of nausea, heartburn, anorexia, the various forms of breathlessness, vertigo, the various headaches, backaches, heartaches and stomach-aches, the referred pains, the dysurias and dysmenorrhœas, the tinglings and numbnesses, the fidgets and the spots in front of the eyes, will then be made more clear to us. It can scarcely be disputed that diagnosis, prognosis, and treatment will greatly benefit thereby.

That our individual studies of symptoms may prove a pleasant task I shall endeavour to show out of my own small experience. At the same time I shall offer more detailed suggestions for the conduct of the observational method in this field.

Nature and Function of Symptoms.

Symptoms, as has been stated, express a disturbance of function. Although they are often caused by organic disease, they do not express the disease but the disturbance of function which the organic change produces. The same symptoms may thus be produced by functional error or structural flaw. While not specific for diseases, symptoms are, nevertheless, specific for functional errors and these errors, for the most part, depend upon an exaggeration, a depression, inhibition of normal reflex phenomena. The ea of great effort in health is physiologically o the dyspnœa of small effort in heart disease. ina of anxiety or tobacco excess or anæmia ame physiological basis as the angina of rosis, although none of its gravity. nal pain as severe as the pain of intestinal obstruction may occur in gastric or intestinal disease. It is by cer and behaviour of the symptom and by ations that we differentiate. Giddiness may to cerebellar disease, to slight organic changes ne labyrinth, or to transient circulatory effects. gain, it is not on the symptom itself so much as its severity, duration, and associations that we base our diagnosis.

The conception of symptoms as the signals of functional disturbance may seem a very elementary one, but it is none the less important. It is as such rather than as the listed characteristics of diseases that we should wish to view them. We should constantly be asking ourselves "*What does this symptom mean?*" not "*What is it a symptom of?*"

The function of symptoms is presumably protective. Dyspnœa demands general rest for a local and general advantage. Pain in an injured limb compels local rest and so permits repair. The pain of angina pectoris demands instant immobility and so spares the heart in jeopardy from anoxæmia and acute muscle failure. The pain of exaggerated hunger tonus in duodenal ulcer calls for food relief with temporary mechanical and chemical rest for the ulcer. The pain and short, shallow respirations of pleurisy and pneumonia limit the expansion of the chest and rest the inflamed pleura and lung. "Pins and needles" in a cramped limb wake us from sleep and compel us to restore circulation and sensation by movement and friction. Often, we must confess, nature seems to overdo the protective stimulus, for pain may be out of all proportion to the size and gravity of the lesion. Thus the pain of a minute anal ulcer is excessively severe and, although the spasm of the sphincter may shut the canal against the passage of fæces, it is in itself a cause of added pain and by causing constipation may even aggravate the trouble. The protective significance of many other symptoms is obscure, but for the most part they are symptoms whose nature remains at present undetermined. In a more remote and less biological sense symptoms in man are protective in that they compel their victim to seek the advice and aid of others.

The remote physical symptoms of anxiety, hypochondria, and other psychic disturbances are of central origin or to be referred to the emotional plane. They may be due to a loss of balance between vagal and sympathetic activity, or they may be called into action as a mask for truth or as a plea for sympathy. It is also an early lesson of practice that the degree of symptoms primarily due to physical causes may be increased by anæmia, general debility, temperamental factors, or psychic states. Such modifications provide one of the most considerable difficulties encountered in the assessment of the subjective phenomena of disease.

Three Symptoms.

I propose to review some elementary observations on three very diverse symptoms, all likely to be encountered in general practice or medical consulting practice, all capable of expressing organic change or functional disorder, but all—properly assessed—of the greatest help in distinguishing organic from functional disease.

The first symptom is a type of *abdominal pain originating in the colon.* Sometimes of considerable severity it is one for which operations are frequently but fruitlessly performed. The suggested method of analysis of this pain may stand as an example for the analysis of any other visceral pain, and as one plan of attack in the observational study of subjective phenomena.

The second symptom is *nausea.* It is one which may be evoked in health and which occurs in a variety of physical disorders. The method of considering the common factor or factors in the widely varied conditions in which it occurs is another obvious method of approach to an individual symptom.

The third symptom is one of the strangest but apparently one of the most real and vivid of all subjective phenomena. It is the *sense of dying*, the *feeling of impending dissolution*, or *angor animi*, which in the literature is most frequently associated with angina pectoris but which also occurs in several other conditions, as I shall show, and most frequently in the absence of serious structural disease. This symptom being, like nausea, less precise and definable than pain requires other measures of analysis.

COLONIC PAIN.

The particular type of abdominal pain on which these observations are based occurs as a rule in the absence of any demonstrable organic change and is the expression of tonic over-activity or sustained spasticity in the colonic musculature. It is frequently troublesome and persistent, sometimes very severe, and quite commonly leads to appendicectomy or exploratory operations. Here is an account of a case:

A man, aged 30, of spare habit and nervous temperament first began to experience abdominal pains at the time of his final examinations in medicine. After a period of freedom they recurred when he sat for his final Fellowship. They were referred to the right side of the abdomen. Later he experienced them in the upper abdomen and occasionally he had pain in both iliac fossæ. In the past he had suffered from asthma and migraine. When he first consulted me he had been examined with X rays on no less than six occasions, and had been diagnosed as having both a hypertonic and a hypotonic stomach and as a case of "nerves." Fatigue and worry were the chief aggravating factors. On one occasion he thought he had appendicitis, but then discovered that what he took for rigidity was a hardened cæcum or ascending colon. I found a cord-like descending colon, and on another occasion an easily palpable and contracted ascending colon. With reassurance and modifications in his mode of life his health improved greatly. In his attacks he found that belladonna gave him great relief.

The condition has been variously described as spastic colon, spasmodic constipation, and tonic hardening of the colon. It is a visceral neurosis akin to asthma. Its ætiological and clinical characters I have discussed fully elsewhere.[1,2] Anxious to investigate the nature of the disorder and the cause of the pain, I analysed my notes of 50 cases and applied to the pain itself certain tests or queries which have been helpful to me in the study of other pains. These tests or queries are in the form of ten questions relating to: (1) the character of the pain; (2) its degree or severity; (3) its situation; (4) its localisation or extent of diffusion; (5) its paths of reference; (6) its duration; (7) its frequency; (8) its special times of occurrence; and (9) and (10) its aggravating and relieving factors. These are finally correlated with associated symptoms and objective phenomena. The purpose of these questions is simply to make our knowledge of the pain more precise. Too often we are content with the patient's statement that he has a "pain in his belly." As anatomists, physiologists, and psychologists we should desire to know much more than that, and even if we are not dealing with measurable things we should, whenever time and opportunity permit, evolve methods of improving our standards of clinical accuracy.

The answers to these questions in the case of spastic colon are as follows:—

(1) The *character* of the pain is a "dull, steady ache," sometimes gnawing and never "griping" as in the peristaltic pain of purgation or obstruction.

(2) Usually "bearable" it is occasionally so severe as to suggest one of the major "colics."

(3) Its *situation* is in the course of the ascending, the descending, or transverse portions of the colon, in this order of frequency. It may occur in one or more of these situations simultaneously. There may also be rectal pain.

(4) and (5) The *localisation* corresponds accurately with the true surface marking or radiologically observed course of the colon. Sometimes it is more diffuse. Referred pain and tenderness in the somatic planes are rare.

(6) and (7) The *duration* of the pain may be for an hour, hours, or even days. The frequency is very variable and depends largely on personal and environmental factors.

(8) A special *time of occurrence* is two or three hours after food, and of [illegible] during the night when, with warmth and physical and mental relaxation, the pain usually departs.

(9) *Aggravating factors* include cold, fatigue, worry, constipation, purgatives, jolting, exercise, and tobacco.

(10) *Relieving factors* include warmth, holidays, belladonna, and large warm enemata.

Associated symptoms include constipation frequently and diarrhœa less frequently; dysmenorrhœa; urinary frequency; and "dead fingers" in cold weather. The chief objective finding is a readily palpable and firmly contracted colon due to tonic rigidity, shortening and straightening of the affected portion. The sigmoidoscope may show a sustained spasm synchronous with pain. An X ray examination may reveal thread-like narrowing of the bowel lumen, straightening of the affected loop, and disappearance of natural haustrations.

From these and other observations it seems only reasonable to conclude that the pain itself is due to a sustained tonic contraction of the bowel, and that this depends upon an inherent irritability occurring in association with certain physical and temperamental types.

What are the practical and the philosophical advantages of such an inquiry? In practice it enables us with greater confidence and I believe a diminishing margin of error to differentiate an important visceral neurosis from appendicular disease, duodenal ulcer, diverticulitis, carcinoma coli, renal and biliary colic, ovarian and tubal disease, and hypochondria. All of these at times have been alternative diagnoses in the minds of myself or of colleagues who have referred cases of this kind to me.

The philosophical value comes from the application of a definite method to a simple clinical inquiry and from the small increments of knowledge gained thereby. To the physiologist or the physicist the procedure may seem clumsy and lacking in anything savouring of exactitude, dealing as it does with processes which cannot be measured. Nevertheless their precise experimental methods would find no application at the present time in the solution o such a problem. To the field naturalist—and t physician is the field naturalist of medicine— procedure might appear as a reasonable and ap priate attempt to improve the accuracy of observational method.

NAUSEA.

With a symptom such as nausea we are in gr difficulty for, although we understand quite clear what we mean by nausea, we can scarcely describe it in the way that we can describe a pain. Even its localisation is a difficult matter and at present we must accept that it is felt in the pharynx and the epigastrium, sometimes more in one place than the other, sometimes in both together. General sensations of malaise and faintness commonly accompany it. The symptom can be engendered in various ways in healthy people. Some are more sensitive than others and women are more readily afflicted than men. A revolting sight or smell or even the thought or recollection of something unpleasant may induce it, and it here provides a good example of the conditioned reflex. The ingestion of greasy or fatty dishes, of paraffin or castor oil, or the smell of frying—all these particularly in hot weather, when the appetite sense is dulled—are familiar provocatives of nausea. Of foodstuffs it is particularly noteworthy that fats and oils are the most culpable, crisp and savoury foods the least. It appears more easily after repletion. The thing which engender appetite combat it; those which destroy appetite encourage it. Anorexia and nausea are very close allies. Now certain emotions, oils and fats—as can be shown experimentally—

TRANSPLANTATION OF A TERATOMATOUS OVARIAN TUMOUR IN THE FOWL.

PRODUCTION OF A SEX HORMONE BY THE CELLS OF THE TRANSPLANTS.

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BY the discovery of the filtrable sarcomas of the owl Peyton Rous provided a working basis for the experimental investigation of the virus theory of cancer. In spite of much subsequent work, however, the precise relationship between these fowl tumours and mammalian cancer remains an open question. An important point on which information is lacking is the behaviour of the *carcinomas* of the fowl in respect of filtrability. There has been no material on which to investigate this matter, since up to the present a strain of transplantable fowl carcinoma has never been established. The difficulties of establishing such a tumour strain arise in the first place from the fact that carcinomas in the fowl commonly originate in the ovary or other internal organ and are not diagnosed until the bird is moribund or dead; except by a fortunate chance, therefore, it is impossible to obtain fresh material for transplantation. Epidermal carcinomas occur in the fowl, and Peyton Rous attempted to transplant such tumours arising in the scaly part of the leg; in this case, as with most superficial tumours, unavoidable sepsis was the main cause of failure.

I have had the good fortune to secure a perfect fresh, non-infected ovarian tumour in a fowl; has been successfully engrafted into several birds the first generation of transplants and offers a prosp of establishing the tumour strain.

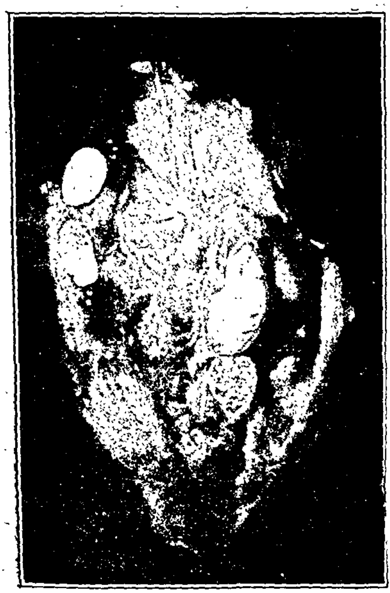
Since this tumour is of interest not only on acco of its histological structure but also by reason of fact that it produces an internal secretion of nature of a sex hormone, I have thought it wo while to give a preliminary account of it.

Description of Tumour.

The tumour occurred in a white leghorn pull The bird was sent to me on account of a hæmorrh spot on the back; when received it appeared in go condition.* I kept it under observation for a f weeks and it still maintained a healthy appeara with a bright red comb as if it were laying; no were produced, however.

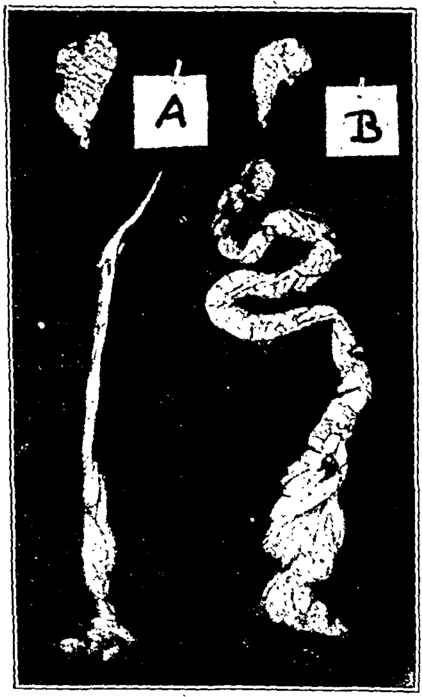
It died suddenly one morning a little time af being removed from its pen for inspection. A p mortem examination made shortly afterwards show that death was due to intraperitoneal hæmorrh associated with a large abdominal tumour; this a rather soft brain-like mass filling the periton cavity and displacing the intestines upwards towards the right. The growth had a smooth crea white surface covered by a network of disten veins; it was composed of several rounded lobu and was attached to the ovarian region by a slen

FIG. 1.



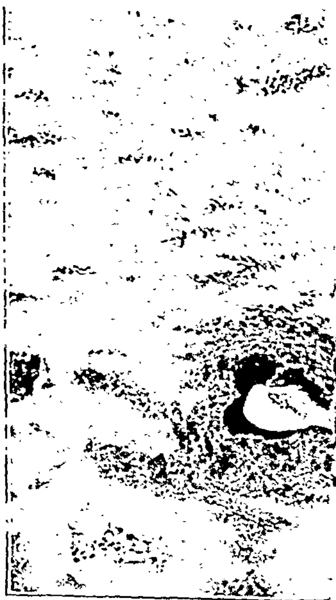
Tumour transplants in bird No. 1. Right side of the breast with the superficial pectoral muscle turned aside. The cut surface of four ovoid tumours are seen. (About four-fifths natural size.)

FIG. 2.



The oviducts and ovaries of a normal control bird (A) and of the fowl bearing the grafts shown in Fig. 1 (B). The control bird was the larger and shows a larger ovary; it has an immature oviduct, corresponding to its age and degree of ovarian development. The tumour-bearing fowl shows a precocious development of the oviduct which is markedly hypertrophied and has assumed the convoluted form. (About four-fifths natural size.)

FIG. 4.



Low power view of a section of one the transplant tumours in f No. 2. Tubules lined by colum cells are seen in the lower part of picture; the upper portion sh the type of tissue which formed main mass of the original and of transplanted tumours. The irre lar patches and strands of c lipoid-containing cells form main feature of this tissue.

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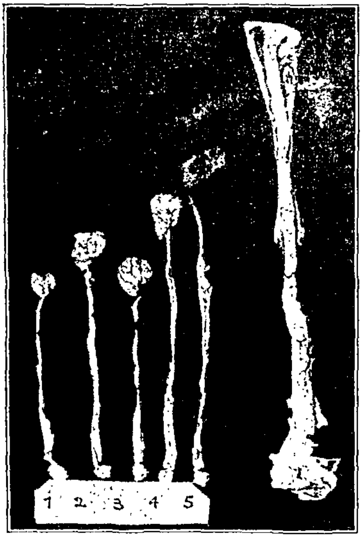
* I am much indebted to Mr. R. H. Cory, poultry bree for supplying me with this other tumour-bearing fowls; his coöperation the fresh material required for this work not have been obtained.

pedicle carrying its blood-supply. Some half dozen rounded tumours of the same colour and consistence as the main mass and ranging in size from about 0·2 to 1·0 cm. in diameter were found attached by pedicles to the lower pole of the ovary. Scattered over the mesentery and attached to the surfaces of the intestines were a large number of rounded tumour masses ranging in size from about 0·1 to 2·5 cm. in diameter, the majority being 0·2–0·3 cm.

The ovary, which was intact (the various pedunculated tumours being attached only at the lower pole), appeared immature and showed no signs of ctivity, the largest follicle being no bigger than a in's head. In contrast to this immature ovary I vas surprised to find a large, fully developed oviduct imilar to that of a laying hen. The remaining organs howed no signs of abnormality.

FIG. 3.



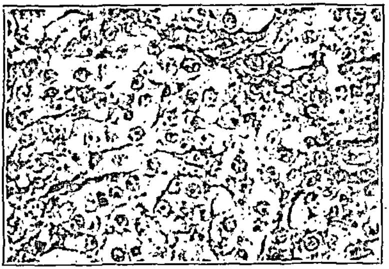
he oviduct and ovary of another tumour-bearing fowl (No. 3) is seen on the right of the picture. The oviduct has been uncoiled and pinned out. For comparison the oviducts and ovaries of five normal birds (1–5) of about the same age. The ovaries of four of these control birds (2–5) are more mature than that of the tumour-bearing fowl; the latter, however, shows a much larger and more mature oviduct. (*Half natural size.*)

TRANSPLANTATION.

(Expt. 182/30 : Oct. 28th, 1930.) A suspension of ragments obtained by mincing portions of the main umour was injected into the pectoral muscles and varian region of a series of fowls. Somewhat over dozen nearly adult fowls, mostly barred rocks, and even white leghorn chicks, 4–6 weeks old, were sed.

Portions of the tumour were also given to Dr. . A. Murray, and were inoculated into a series of owls at the Imperial Cancer Research laboratories t Mill Hill by Dr. L. Foulds. Of the series inoculated y myself only the white leghorn chicks have taken; four of these unfortunately died of intercurrent disease while the tumour grafts were a few millimetres in diameter, one remained negative, in two grafts took well and reached a considerable size. Dr. Foulds obtained takes in several of his fowls, two of which he has kindly handed over to me for examination.

FIG. 5.



A high power view of the clear lipoid-containing cells seen in the previous figure.

These four birds, therefore, form the material for the present preliminary communication; the number is, unfortunately, small but the changes produced are sufficiently uniform and striking to leave little doubt as to their significance.

Three of the tumour-bearing fowls and one negative bird of the same batch were killed 14–16 weeks after inoculation. My fowls which had been kept indoors were only about one-third grown, that from Mill Hill (the same age) was rather more than half grown. The fourth fowl (from Mill Hill) was killed about 19 weeks after inoculation when it was about half grown (weight 900 g.).

Fig. 1 represents the right side of the breast of one of my birds (No. 1) with the superficial pectoral muscle turned aside; it shows four ovoid tumour masses, the largest of which measured about 2 cm. in longest diameter. These tumours were of fairly soft consistence, and showed for the most part a uniform cream-colour surface; in places, however, hæmorrhagic mottling and small cystic spaces could be seen.

My other fowl (No. 2) showed three similar tumours and several smaller nodules. The first fowl from Mill Hill (No. 3) had a considerably larger soft cystic and papillary mass filling the greater part of the right side of the breast; it was yellower in colour than were the tumours in the other birds. The second Mill Hill bird (No. 4) had a rounded tumour measuring about 5 × 6 cm., yellowish-white in colour. There were no secondary deposits in any of the fowls and the peritoneal inoculations had only resulted in a few nodules a millimetre or so in diameter in the first three birds; in the last bird there was a nodule about 1·5 cm. in diameter. On removing the intestines, however, a striking enlargement of the oviduct was at once apparent in all four tumour-bearing birds.

Under normal conditions the immature oviduct is seen to be a thin-walled straight duct extending from the lower pole of the ovary to the cloacal region. It is a flattened strand of tissue with a slit-like lumen; the lower end is imperforate and remains so until full development is reached. Not until there is considerable development of the ovary with the formation of numerous enlarged pedunculated oöcysts does the oviduct show much increase in size. With the continued development of the ovary, however, the oviduct increases in thickness and in length, forming a convoluted tube rounded in cross section.

In Fig. 2 is seen the appearance of the oviducts of a normal control (A) and of a tumour-bearing fowl (B). The control bird was from the same batch as the tumour-bearing chicken, but was somewhat larger; it had been inoculated with transplant material but failed to take. It can be seen that, while the ovary of the tumour-bearing bird (B) is smaller than that of the control, its oviduct has markedly hypertrophied and has assumed the convoluted form. Another feature of the hypertrophied oviduct (which cannot be seen on the figure) is the development of an opening into the cloaca; this is lacking in the control specimen, and indeed in much older fowls with well-developed ovaries and oviducts which have developed to a considerable degree.†

In Fig. 3 is shown the oviduct of bird No. 3, as compared with a series from normal fowls (1–5) of about the same age or somewhat older. In this case the enlarged oviduct has been uncoiled and pinned out straight, and the ovary has been placed beside it. The poor development of the ovary again contrasts with the great hypertrophy of the oviduct.

The condition found in birds No. 2 and No. 4 was similar to that in the two described above.

HISTOLOGICAL CHARACTERS.

Examination of paraffin section of the original tumour and of the transplants shows that the main bulk of the growth is composed of polygonal or ovoid cells. The cell nucleus is rounded and usually contains a prominent nucleolus. Two types of cell can be easily distinguished—one with slightly acidophile, non-granular cytoplasm, the other, rather larger, with clear vacuolated cytoplasm. In addition to this main cellular mass are found sparsely scattered islands containing columnar-celled tubules and small cysts, and also masses and strands of keratinising squamous cell epithelium. These epithelial structures have been found in some of the mesenteric nodules of the original tumour and in two of the transplant nodules in bird No. 2. Sections stained for fat show that the cells with clear cytoplasm are loaded with fatty material which when viewed with polarised light is seen to contain many doubly refractile crystals.

Fig. 4 shows a low power view of a section of one of the transplant tumours in bird No. 2. Tubules lined by columnar cells are seen in the lower part of the field. The upper half of the picture shows the type of tissue which forms the main mass of the tumours; the irregular patches and strands of clear lipoid-containing cells constitute the most obvious feature of this tissue. Fig. 5 shows a high power view of these clear cells. Here the general appearance is not unlike that of the cortex of the suprarenal; the arrangement of the cells is, however, much more irregular.

Discussion.

The histological features of this tumour indicate that it is of the nature of a *teratoma*; the glandular and epithelial elements are, however, scanty and make up a very small proportion of the total bulk of the growth. There is no doubt that the polygonal cells (either the fatty or the non-fatty or both types) are the elements responsible for the production of the hormone. This is shown by the fact that epithelial and glandular elements did not occur in the transplants in birds 1, 3, and 4. There can be little doubt that the fat-containing cells correspond to the "clear cells" which are found in small groups in the theca interna of the follicles of the normal fowl ovary. I have examined frozen sections of normal fowl ovaries and found that these "clear cells" in the theca interna contain in addition to fat doubly refractile crystals similar to those in the tumour cells. These cells were considered by Pearl and Boring (1918) to be homologous with the lutein cells of mammals; this view has, however, not received general acceptance. (Goodale, 1919; Nonidez, 1920.) Goodale considered that they very possibly represented the interstitial cell of the mammalian ovary. As it is now well established that the function of the corpus luteum is to furnish a hormone which produces progestational changes in the endometrium, there seems no reason to expect a homologous structure in birds. A more reasonable supposition would be that the hormone-producing cells of the fowl's ovary represent an original type from which both the œstrin-producing and the lutein cells of the mammal have evolved; however, no definite evidence on this question is at present available.

The non-fatty cells of the tumour are less sharply defined; they appear, however, to grade imperceptibly into the fatty type; there seems little doubt that these cells, like the fatty cells, represent the theca interna of the follicles. It is possible that the cells of the stratum granulosum also are represented.

As regards the nature of the hormone produced by this growth, the general hypertrophy of both the musculature and the mucosa of the oviduct with the canalisation of the genital orifice appears to correspond fairly well to the effect of œstrin upon immature rats or mice; whether the active agent in birds is identical with mammalian œstrin is, however, a matter for further investigation.

This growth has taken comparatively well in the first transplant generation and a considerable number of young fowls have been inoculated from these transplants; it is hoped, therefore, that it will be possible to establish a permanent tumour strain.

SUMMARY.

A teratomatous tumour of the fowl's ovary has been successfully transplanted to the first generation of hosts. The predominating cells in the original tumour and in the transplants resembled those in the theca interna of the ovarian follicles, lipoid-containing cells being a prominent feature. In addition, there were sparsely scattered groups of columnar-celled tubules and keratinising epithelial masses. The original tumour-bearing fowl showed a fully developed oviduct but an undeveloped immature ovary. Young birds bearing tumour transplants showed a precocious development of the oviduct, the cloacal orifice of which became perforate. The ovaries of these birds remained immature.

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† According to Glasser, quoted by Lillie, the oviduct does not become perforate until *after* the age of 6 months. I have specimens from several barred rocks 7–8 months old (weight 1800–2000 g.); the ovaries of some contain small yolks, 0·6 cm. in diameter; in none is the cloacal orifice of the oviduct perforate.

INDUCTION OF ABORTION.

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THE problem of induction of abortion is always productive of interesting discussion and it may be of value to record all the cases on which this operation has been performed in the obstetric and gynæcological unit of the Royal Free Hospital from 1921 to 1929.

Reasons for Induction.

In all, 50 cases were induced out of a total of 6617 deliveries in the in-patient department during a period of eight years—a percentage of 0·75. There were no deaths in the series. Of these 50 patients, 18 were induced for tuberculosis of the lungs, 11 for cardiac disease, 9 for kidney lesions, 4 for diseases of the nervous system, 3 for carneous mole, and 5 for various lesions: cardiac lesion and acute hydramnios (1), arsenical poisoning and syphilis (1), cardiac lesion and pulmonary tuberculosis (1), following operation for fibrosarcoma of abdominal wall (1), acute dyspnœa ? cause (1).

Tuberculosis.—The reasons for performing induction of abortion for tuberculous disease of the lungs appear to fall into three groups:—

(*a*) Induction early in pregnancy for early active tuberculosis which would inevitably be rendered more severe by pregnancy and the puerperium. Induction is performed so that the patient may at once undergo suitable treatment. *Six cases.*

(*b*) Induction for comparatively advanced tuberculosis which would be rendered worse by pregnancy or the puerperium but, though severe, presents some hope of improvement or cure if suitable treatment can be instituted without delay and unhampered by pregnancy. *Nine cases.*

(*c*) Induction in extremely advanced cases when there is little hope of cure of the patient or even of recovery but when the patient desires intensely that the operation should be performed. *Three cases.*

Induction in tuberculosis is only performed after consultation with a specialist in diseases of the lung. Coöperation between hospitals for diseases of the chest, sanatoria, and maternity hospitals should be encouraged to the greatest extent possible. Most of the cases of tuberculosis are sent to the obstetric unit by special hospitals for the purpose of induction, and it is only after careful consideration that the operation is performed.

Cardiac disease.—Eleven cases were induced, for the following lesions: 1. Mitral stenosis with failure of compensation (4). 2. Mitral stenosis with auricular fibrillation and heart-block (1). 3. Mitral stenosis and regurgitation with failure of compensation (2). 4. Double mitral and double aortic lesions with failure of compensation (1). 5. Complete heart-block (1). 6. Myocardial disease with high blood pressure (1). 7. Congenital pulmonary stenosis (1).

The majority were mitral stenoses with failure of compensation early in pregnancy. These were all patients who had had a number of children and in whom the cardiac lesion had become progressively worse with each pregnancy. In a few cases of cardiac failure of sudden onset which does not respond to treatment, induction of abortion may be necessary, but in these multiparæ it would probably have been better to perform Cæsarean section and sterilisation during an earlier pregnancy. This, however, may not always be possible, as the wishes of the parents have to be taken into account, and sterilisation may be refused.

The onset of auricular fibrillation during early pregnancy is almost always an indication for the induction of abortion, as is the presence of complete heart-block; though in the one case recorded with this lesion the previous pregnancy had been undergone with no symptoms, except during the second stage of labour, which was terminated by forceps owing to the onset of cyanosis. Severe lesions of the myocardium may be an indication for induction, if failure is apparent in the early stages of pregnancy. Congenital lesions rarely present any indication for induction and the case recorded, in view of recent work on cardiac cases and of the history of the case, was probably induced unnecessarily.

Again, no operation is undertaken without consultation with the cardiologist attached to the department. The obstetric unit has had for a number of years a special antenatal cardiac clinic, and all cases with any suspicion of cardiac lesions are referred to the clinic and there undergo thorough investigation.

Renal lesions.—Nine cases were induced for lesions of the kidneys: 1. Chronic nephritis (4). 2. Acute exacerbation of chronic nephritis (1). 3. Acute nephritis (1). 4. Acute pyelitis (3).

By far the most important group in this series is the first. In view of the serious effects of pregnancy on chronic kidney lesions, it is wise not to postpone termination of the pregnancy for too long, as the lesion is in all cases rendered worse by the pregnancy and puerperium. This applies also to groups 2 and 3. Consultation with a physician and careful and frequent biochemical examinations should be performed before and after induction.

Pyelitis during pregnancy is rarely so severe as to necessitate the induction of abortion. It usually yields quickly to treatment by large doses of alkalis. Induction on the one case in this series was performed because the patient had previously had a nephrectomy.

Diseases of the nervous system.—4 cases: 1. Parkinsonian syndrome following encephalitis lethargica. 2. Tabes dorsalis. 3. Disseminated sclerosis. 4. Epilepsy.

Few diseases of the nervous system necessitate the induction of abortion. Epilepsy, unless very severe, is not usually an indication. The cases of tabes dorsalis and disseminated sclerosis had great difficulty in walking and the patient with the parkinsonian syndrome was in very poor condition and unable to get about at all. In all these cases the lesions were definitely rendered worse by the pregnancy.

Obstetrical lesions.—5 cases: 1. Carneous mole (3). 2. Acute hydramnios with collapse of right lung and mitral stenosis (1). 3. Acute hydramnios (1).

Miscellaneous medical and surgical lesions.—4 cases: 1. Pulmonary and laryngeal tuberculosis and mitral stenosis with heart failure. 2. Arsenical poisoning and syphilis. 3. Following removal of fibrosarcoma of right rectus abdominis muscle. 4. Acute dyspnœa of unknown origin.

Carneous moles are occasionally expelled spontaneously but often require interference. Induction should only be performed after careful observation to make certain that the pregnancy is not continuing. Acute hydramnios is a comparatively rare condition but the treatment and method of induction is simple.

The incidence of cardiac disease and pulmonary tuberculosis in the same patient is uncommon, as is arsenical poisoning following on treatment for syphilis. The patient from whom a fibrosarcoma had been removed would, if the pregnancy had been allowed to continue, have been liable to a very severe strain on the abdominal scar and her abdominal musculature would have been very weak. In the last case in the series, which occurred some years ago, the notes are too scanty to allow of an accurate diagnosis.

Detailed descriptions of all the cases in the series have been omitted for lack of space.

Methods Used.

The methods used were as follows: 1. Drugs alone. 2. Drugs combined with other methods. 3. Rupture of membranes with or without dilatation of the cervix. 4. Dilatation of the cervix and insertion of small bag. 5. Stomach-tube. 6. Bougies. 7. Version and pulling down a leg after dilatation of the cervix. 8. Dilatation of the cervix and clearing out the contents of the uterus with finger and ovum forceps. 9. Packing the vagina alone. 10. Insertion of rubber catheter into uterus and packing the vagina. 11. Dilatation of the cervix and insertion of gauze wick soaked in glycerin into the uterus and packing the vagina. 12. Dilatation of the cervix and insertion of laminaria tents with or without packing the vagina. 13. Insertion of catheter (self-retaining) filled with glycerin into the uterus, combined with laminaria tents and packing the vagina.

1. *Drugs alone.*—Drug induction by castor oil and hot baths, followed by quinine or injections of oxytocin, appears to have little value in the induction of abortion. From experience we have found that the uterus is only sensitive to the action of these drugs when approaching term. Drugs alone were used in four cases and failed in all (8 per cent. of cases—100 per cent. failures).

2. *Drugs in combination with other methods* were sometimes given and appeared to improve the strength and frequency of uterine contractions once these had been initiated.

3. *Rupture of membranes* with or without dilatation of the cervix was used in two cases, one in each category (4 per cent.), with success in both: in the first 48 hours later, in the second five hours later. This method is eminently suitable and successful for cases of acute hydramnios.

4 (*a*). *Dilatation of cervix, rupture of membranes, and insertion of hydrostatic bag* was used in one case (2 per cent.) with success 48 hours later. This method is to be condemned in that the insertion of a hydrostatic bag after rupture of the membranes involves a grave risk of sepsis.

4 (*b*). *Dilatation of cervix and insertion of small hydrostatic bag* was the method in eight cases (16 per cent.) with success after three days in two cases (25 per cent.) and failure in six cases (75 per cent.). This method is not to be recommended. It is as a rule slow and unreliable. It also almost certainly involves dilating the cervix with Hegar's dilators to a fairly high number (about 20). This procedure necessitates an anæsthetic, which in many cases is inadvisable.

5. *Insertion of a stomach-tube*, combined with packing the vagina, was used in seven cases (14 per cent.) with success in six cases, on an average 34·8 hours later (85·7 per cent.), and failure in one case (14·3 per cent.). This method has good points but is only suitable for inductions of abortion from the twentieth to twenty-seventh week, as the stomach-tube is usually too large to be used before that time. Success depends upon getting as much as possible of the tube into the uterus between the membranes and uterine wall. An anæsthetic is rarely needed except for very nervous primiparæ. The time of onset of pains is variable; sometimes rapid, sometimes slow. Labour is hastened by dipping the tube in glycerin before inserting it into the uterus and by packing the vagina with gauze soaked in glycerin and flavine. The method is to be preferred in the induction of labour.

6. *Bougies*, combined with packing the vagina, were used in one case (2 per cent.) with success three days later. The remarks about induction with the stomach-tube apply to this method but there is the disadvantage that the danger of sepsis is probably greater, as several bougies are usually inserted, and also there is more danger of separating the placenta.

7. *Version and pulling down a leg* after dilatation of the cervix and rupture of the membranes was the method in eight cases (16 per cent.) and had no failures. Success was achieved on an average 27·7 hours later. This method is successful and often rapid, but again necessitates previous dilatation of the cervix and intra-uterine manipulation with consequent danger of sepsis, and requires anæsthesia.

8. *Dilatation of cervix and clearing out uterus* under anæsthesia by the rapid method was used in seven cases (14 per cent.) with success in five cases (71·4 per cent.). In two of these cases severe hæmorrhage occurred. One was followed by sepsis, necessitating a hysterectomy later. The uterus was incompletely emptied in two cases, the rest of the products of conception being passed some days later. This was a failure in technique. This method has the advantage of being rapid, but the grave disadvantage of being associated frequently with severe hæmorrhage and shock. It necessitates an anæsthetic.

9. *Packing the vagina and cervix only* was tried in two cases (4 per cent.) but both were failures. This method is useless alone.

10. *Insertion of catheter into uterus and packing the vagina* was used in three cases (6 per cent.) with two successes (66·6 per cent.). This method is very uncertain, as the introduction of a small catheter is rarely a sufficient stimulus to initiate uterine contractions.

11. *Dilatation of cervix and insertion of gauze wick*, soaked in glycerin into uterus, and packing the vagina, was the method in two cases (4 per cent.) and both were successes. In this method, again, the gauze wick inserted between the membranes and uterine wall, even when soaked in glycerin, appears to be an insufficient stimulus to initiate uterine contractions rapidly and the method may have to be repeated.

12. *Insertion of laminaria tents* with or without catheter and previous dilatation of cervix and packing the vagina was done in 16 cases (32 per cent.) with success in ten cases (62·5 per cent.), and failure in six cases (37·5 per cent.). Laminaria tents alone are rather uncertain. Success is more often ensured when several tents and not one alone are inserted. It is possible that the chance of success is increased when the vagina is packed tightly with gauze soaked in glycerin. The advantage of tents is that an anæsthetic is rarely necessary.

A METHOD OF CHOICE.

13. *Insertion between the uterine wall and membranes of a self-retaining catheter* filled with glycerin, injection of 10 c.cm. of sterile glycerin into the uterus, insertion of two or three laminaria tents into the cervix, and packing the vagina with gauze soaked in glycerin and flavine. This was the method in eight cases (16 per cent.) with success in all (in one case the first induction failed, but the second succeeded three days later). The average length of time elapsing before abortion took place was 26 hours.

This method has been the most successful and has been in use in the obstetric unit for the last two years. As far as can be seen from a very small number of cases, it promises to be a valuable addition to the methods already in use and merits further trial.

The cases reported were about 16 weeks pregnant and it is for this type of case that it has been found most useful. No anæsthetic is needed if the patient is a multipara, and the method is practically painless. The patient is placed in the lithotomy position and the usual aseptic precautions are taken. The cervix is grasped gently with a pair of sponge forceps and a No. 7 self-retaining catheter, filled with sterile glycerin, is passed into the uterus between the membranes and the uterine wall as far as possible. About 10 c.cm. of sterile glycerin is then injected into the uterus by means of a record syringe. Three or four laminaria tents are then inserted through the cervix and the vagina is packed with gauze soaked in glycerin and flavine. The pack is removed in 12 hours and the catheter, if necessary, left for 72 hours. It is rarely necessary to leave the catheter in as long as this, as abortion usually occurs before 72 hours have elapsed. For success, it is essential that (1) as many tents as possible should be inserted and (2) the tents and catheter should not be removed early. In the successful cases the tents and catheter are expelled with the abortion.

In performing induction of abortion upon patients suffering from cardiac lesions or pulmonary disease it is of value to use a method which is comparatively rapid yet does not cause shock or hæmorrhage, as is often the case when a uterus is cleared out by dilating up the cervix under anæsthesia and removing the ovum with the finger and sponge forceps. It is also of value in some cases to have a method which can be carried out without an anæsthetic.

The method described, as far as can be gathered from the results of a very few cases, appears to fulfil these conditions and merit further trial. No ill-results have followed on the injection of glycerin into the uterus.

Advantages of Induction.

At a recent meeting of the Edinburgh Obstetrical Society, Dr. W. F. T. Haultain[1] reviewed a series of patients on whom abdominal hysterotomy had been performed for the purpose of therapeutic abortion. He regards it as an operation superior to slower methods, especially in primiparæ, "where induced abortion between the third and sixth months is a most painful and tedious business." With this statement I venture to disagree; I find that the last method described in this paper produces admirable results with very little pain or delay and without the necessity for an abdominal operation. The abdominal hysterotomy, however, has an advanatage in the treatment of hydatidiform mole and also in that sterilisation can be performed at the same time.

With advance and improvement in the art of medicine and obstetrics, it is often possible to avoid operative procedures such as the induction of abortion. The early recognition and improved treatment of diseases of the heart has reduced the numbers of cases needing this operation. It is now only performed on selected cases, especially those in whom treatment during the early stages of pregnancy has failed to improve failing compensation. We must hope that in the future the great efforts which are being made towards the prevention of rheumatism will considerably reduce the incidence of rheumatic cardiac lesions. This will undoubtedly have its reflection in the incidence of cardiac lesions during pregnancy and will be a factor in the reduction of maternal mortality. We must hope, too, for some equally striking efforts towards the prevention of tuberculosis of the lungs. Improved antenatal care has helped very largely to reduce the severe toxæmias of pregnancy. Induction of abortion is rarely necessary in these diseases, as toxæmias are more often found during the later months of pregnancy. Again, it is to preventive medicine that we must look for aid in decreasing the number of chronic kidney lesions, some of which follow toxæmia in a previous pregnancy; from this cause arise a number of cases in which it is necessary to induce abortion.

Another problem of great importance that must always be kept in the mind of the obstetrician who undertakes the operation of induction of abortion is the possibility and advisability of future pregnancies. In specially selected cases, for a cogent reason—cases in which a future pregnancy may be contemplated with hope of a successful conclusion—it is a justifiable operation. In many cases—for example, in patients with very severe cardiac lesions who may at a later date again become pregnant, necessitating perhaps another similar operation—the induction of abortion is highly unsatisfactory. If possible, in this type of case, some safe method of preventing further pregnancy is more desirable. The only completely safe method involves sterilisation of the patient by operation, X rays or radium therapy being occasionally unreliable. Sterilisation will not always be accepted by patients. Induction of abortion alone will remain as a method of treatment in a certain number of "undesirable" cases. In this type of case, medical advice with regard to contraceptive methods may be of value after the operation.

The relative merits of (1) induction of abortion alone, (2) induction of abortion followed by some suitable method of sterilisation, (3) Cæsarean section and sterilisation (in those cases where the condition would permit of the continuance of the pregnancy nearly or quite to full term) must be considered seriously in all cases under observation.

I am indebted to the Director of the Unit, Dame Louise McIlroy, for permission to publish these cases.

INTENSIVE SERUM TREATMENT OF CEREBRO-SPINAL FEVER.

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THE clinical potency of antimeningococcal serum in any given case depends upon the amount of anti-endotoxin contained in the serum against the particular type of meningococcus concerned.[1] Probably the best results ever obtained in the treatment of established cerebro-spinal meningitis are those recorded in the first official report on Type I. univalent antimeningococcal serum[2]—viz., 33 recoveries out of 34 Type I. cases treated. This was the remarkable result obtained towards the end of the war period with this highly specific serum in the hands of known, careful, and active clinicians.

Very few of the practitioners who are now called upon to treat cases of cerebro-spinal fever have had personal experience of treatment of the disease with univalent type serum. For this reason, and also because of the difficulty of rapidly determining the type of infecting organism in any given case, there has been no effective demand for univalent serum since the war, and, in consequence, little or none of it has been produced. I had the fortunate experience of treating a few cases with this serum in the years 1919 and 1920. Its highly specific action was seen particularly in the case of a child aged 15 months, in the fourteenth day of the disease with turbid cerebro-spinal fluid containing Type I. meningococci. In this case, the temperature fell to normal by crisis and all clinical signs of the disease disappeared *within 12 hours* of the intrathecal injection of a single dose of 20 c.cm. univalent Type I. serum.[3] It seems, therefore, a matter of great regret that the Departments of State concerned have not seen fit to maintain a supply of this highly potent serum since the war. The serum available on the market to meet the outbreak of 1931 is of the multivalent variety, and according to M. H. Gordon (personal communication, March 7th, 1931) it contains little or no anti-endotoxin against the dangerous Type I. meningococcus.

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[1] Brit. Med. Jour., 1930, ii., 62.

In general it may be said that the therapeutic potency of the multivalent antimeningococcal serum available in recent years in this country is weak. Reference to the Glasgow outbreak of 1929,[4] with its mortality-rate of 83·6 per cent. among 134 cases, and to the Lanarkshire figures for the ten years 1920–29 (83·1 per cent. among 65 cases[5]), seems to afford tragic confirmation of this statement.

Gordon has pointed out that great improvement in the therapeutic potency of antimeningococcal serum available to the troops took place in the later years of the war, and associates with this fact the 35 per cent. military mortality in 1918 compared with the 60 per cent. mortality in the same year among civilian males aged 20 to 30.[1]

ROUTE OF INJECTION.

If we are compelled to use a weak therapeutic serum it seems obvious that larger doses are indicated than those generally used in the case of a potent serum. The method of serum administration generally recommended in the meningitic stage of cerebro-spinal fever is repeated intrathecal injection of amounts of about 20 to 40 c.cm. after lumbar puncture and evacuation of rather more than this quantity of cerebro-spinal fluid. By intrathecal injection alone it is impossible or inadvisable to give larger doses of serum on account of the dangerous rise of pressure in the cerebro-spinal system which might take place. If larger doses of serum are to be given and to be rapidly absorbed, the routes available are the intramuscular, intravenous, and intraperitoneal. By these routes it is quite practicable to give doses of serum of 100 to 200 c.cm. at a time.

It has, perhaps, been too readily assumed that antimeningococcal serum injected by these routes is inert *in the meningitic stage of the disease*; Worster-Drought and Kennedy in their monograph[6] (p. 404), make the following statement:—

> "In the presence of meningitis, serum injected subcutaneously or intravenously is useless; not only does it undergo an extremely high dilution in the blood stream, but there is considerable doubt if it ever reaches the subarachnoid space at all. Dixon and Halliburton and others have shown that although the lining membrane of the subarachnoid space is permeable to substances passing from the cerebro-spinal fluid to the blood, it appears quite impermeable, excepting in the case of a few drugs—e.g., hexamine, and oxygen in the reverse direction—from blood to cerebro-spinal fluid."

This objection appears, however, to be a purely theoretical one in so far as antitoxin is concerned. The method of injection of large doses of antimeningococcal serum intravenously in the meningitic stage does not appear to have been put to a practical test *on any considerable scale in this country*, although it has been done in the United States Army with marked success in a small series of cases by Carbonell and Cook.[7] It seems, moreover, an unwarrantable assumption that because certain foreign materials do not penetrate from the blood to the cerebro-spinal fluid, therefore antitoxin administered intravenously will have no curative effect against organisms lodged in the meninges and elsewhere.

The practical clinical test, although it may be difficult to evaluate, must be the supreme and final arbiter in such a matter.

Intensive Serum Treatment.

Since 1927, it has been my practice to give large doses of multivalent serum—e.g., an initial dose of 100 to 200 c.cm. intravenously—and to do repeated lumbar punctures at 24 or 48 hour intervals, with or without an initial intrathecal administration of serum. There have been a few exceptions to this rule. In the first case treated with a large dose, improvement seemed to date from the administration of 50 c.cm. *serum intramuscularly and 50 c.cm. intrathecally.* In two cases aged 6 months and 15 months, 100 c.cm. and 110 c.cm. respectively were given *intraperitoneally.* In a few cases, chiefly in young infants, intravenous injection was not found to be practicable. In most cases, however, a single dose of 150 to 200 c.cm. was given intravenously. In some cases a second somewhat similar dose—e.g., 100 c.cm.—was given after about 48 hours, if little improvement in the clinical condition had occurred, or, at a later date, in the event of a recrudescence. In one case the intravenous injection was repeated twice, on the eighth and nineteenth day after the first injection, on account of recrudescences, even though, of course, it was recognised that there was a risk of anaphylaxis. At the third injection an immediate serum rash

TABLE I.

Age-grouping.

Age-group ..	0–1	1–2	2–5	5–15	15–30	Over 55	Total.
Recovered cases ..	2	4	2	5	2	—	15
Fatal cases	2	1	3	2	—	1	9
Total	4	5	5	7	2	1	24

Percentage of cases in unfavourable age-groups—i.e., under 5 years and over 55 years =62·5.

Day of Disease on which Treatment Commenced.

Day of disease	2nd	3rd	4th	5th	6th	7th	8th	10th	11th	12th	14th	21st
Recovered cases ..	—	1	2	3	2	2	1	1	2	—	—	1
Fatal cases ..	1	1	1	1	—	—	—	1	1	1	2	—
Total ..	1	2	3	4	2	2	1	2	3	1	2	1

Fatal Cases.

The following features were associated with the fatal issue in nine cases.

Died within 48 hours of admission (fulminating type)	3
Repeated lumbar puncture unsuccessful or infrequently performed	3
Collapse after intrathecal administration ..	1
Age 5 weeks	1
Age 56 years	1

Fatality-rate: 37·5 per cent.

Complications: one case, paresis of arm and face.

appeared, but no dangerous symptoms. Clinical improvement followed rapidly on this third injection, and complete recovery ultimately took place.

During the period April, 1927, to March, 1931, 29 verified cases came under treatment. Of this number, five cases, aged 9 weeks to 2 years, have been excluded from the series, as it was found impossible to give them intravenous serum. The remaining 24 cases were all treated by the intensive method with the results set out in Table I.

The series is too small for conclusions to be drawn, but in view of the unfavourable age-grouping the mortality may be considered significantly low. A prima facie case for further experiment on the lines of intensive dosage, where the serum available is weakly specific, appears to be made out.

The clinical results in the series have not usually suggested a highly specific phenomenon like that obtained in Type I. meningococcal meningitis with the monotypical serum. As a rule, the temperature fell after two to eight days and a gradual clinical improvement set in after two to three days. It was realised in the later stages of the investigation that daily successful lumbar puncture enhanced the chances of recovery in those who did not respond too well to the initial large dose of serum. Had this fact been fully realised earlier, it is possible that three of the fatal cases might have been saved

ILLUSTRATIVE CASES.

The following cases suggest a specific effect of intensive serum treatment. Case 1 had intravenous and intrathecal serum. Case 2 had one dose of intravenous serum only.

CASE 1.—*Boy aged 11 years. Complained of headache* and malaise on Sept. 10th, 1929. Admitted to Royal Infirmary, Leicester, on the 12th; headache then severe, restless, nucal rigidity marked; Kernig's sign positive; temperature 99·8° F. Cerebro-spinal fluid, under pressure and turbid; smears crowded with polymorphs. Sept. 15th, temp. 101°–103° F.; meningococcus grown on culture from cerebro-spinal fluid. Admitted to Isolation Hospital, Leicester (sixth day of disease) very restless, noisy, headache severe, and head retraction extreme.

Treatment. — 160 c.cm. antimeningococcal serum (Burroughs, Wellcome and Co.) intravenously, 40 c.cm. intrathecally. Sept. 16th, opisthotonos present; child most restless, delirious, and shouting out. Lumbar puncture: 60 c.cm. thick *purulent* fluid removed (deposit of ¼ inch yellow pus on standing 3 c.cm. fluid in test-tube). Sept. 17th, opisthotonos extreme; oscillatory movements of eyeballs, very restless. Lumbar puncture: 27 c.cm. purulent fluid removed; 25 c.cm. serum given intrathecally. Sept. 19th, child quieter; head retraction extreme, but opisthotonos less. Lumbar puncture: 47 c.cm. *faintly turbid* fluid. As child appeared to be improving a second large dose of serum, 150 c.cm., was injected intravenously and 25 c.cm. intrathecally. Sept. 20th, child says he feels much better; quiet; no opisthotonos, but head retraction still present. Sept. 21st, lumbar puncture: 39 c.cm. faintly opalescent fluid. Sept. 23rd, much better; no opisthotonos, no head retraction, no rigidity of limbs; taking food well. Lumbar puncture: 26 c.cm. *clear* fluid. Serum rash present. Sept. 25th, lumbar puncture: 56 c.cm. clear fluid. Oct. 11th, very well; allowed up. Oct. 21st, discharged; walking well; no symptoms.

CASE 2.—*Girl aged 18 years. Complained of headache* and pain in back, Jan. 16th, 1931; delirious on the 17th. Admitted to Isolation Hospital Leicester, on the 19th in semi-comatose condition, very restless, and delirious; nucal rigidity marked; Kernig's sign present. Lumbar puncture: very turbid fluid under pressure, containing numerous pus cells and intracellular diplococci.

Treatment. — 200 c.cm. antimeningococcal serum (Burroughs, Wellcome and Co.) intravenously; serum not given intrathecally. Jan. 20th, rigidity more marked; condition generally about the same; temp., 101·4° F. Jan. 21st, rigidity much less; mentally bright; no further delirium. Lumbar puncture: 28 c.cm. slightly turbid fluid. Jan. 22nd, markedly improved; no rigidity; mentally alert. Jan. 23rd, temperature normal. Jan. 24th, lumbar puncture: 42 c.cm. faintly turbid fluid. Jan. 26th, complains again of headache, sickness, and vomiting; evening temperature 101·4° F. Jan. 27th, temperature normal. Jan. 28th, lumbar puncture: 18 c.cm. slightly turbid fluid; evening temperature, 101·8° F.; appears fairly well; no rigidity. Jan. 31st, slight headache; evening temperature 101·2° F.; lumbar puncture: 35 c.cm. faintly turbid fluid. Feb. 2nd, quite well; no rigidity; temperature normal. Feb. 11th, allowed up. Feb. 23rd, discharged. Walking well; no symptoms.

SERUM REACTIONS.

A peculiar feature is that very rarely has any immediate serum reaction followed intravenous injection of these large doses of serum in this group of cases, with the exception of one case where subsequent injections were given more than ten days after the first. As a rule, patients became quieter after the injection, and colour was, on a few occasions, rather poor for an hour or so. Not a single rigor occurred. It seems amazing how well these large *doses of intravenous serum are tolerated in this* disease as compared, for example, with diphtheria. Serum rashes occurred in every case but gave no trouble.

INJECTION IN INFANTS AND YOUNG CHILDREN.

It is undoubtedly difficult to get a needle into a vein of a restless child under 2 years of age, and to inject about eight syringefuls of serum into the blood stream. Nevertheless, it can usually be done with practice and a correct technique.

Several good needles are essential, with sharp point, short bevel, reinforced mount, rigid shaft about 1¼ in. long and bore 0·8 mm.; at least three 20 c.cm. syringes with peripheral nozzles are required. A vein at the bend of the elbow is tried first, the arm being hyperextended at the elbow and firmly squeezed from above and below towards the elbow in order to distend the vein. If failure is encountered here, the external jugular vein can usually be entered more readily. If this fails, a vein in the arm may be dissected out, but this method is not so simple as it appears. Lastly, if all attempts fail, it is justifiable to give the serum *intraperitoneally* in such a serious disease. Absorption from the peritoneum is very rapid, and this route proved successful in the two cases in which it was tried. Intramuscular injection is not suitable for large amounts of serum, as it is a painful process and absorption is slow.

Summary.

1. It is suggested that when it is impossible to determine the type of infecting meningococcus, and to apply the specific univalent serum, as at present in this country, the available multivalent serum, which is weakly specific, should be injected in large doses of 100 to 200 c.cm., preferably intravenously, and, if that is impossible, intraperitoneally, in addition to the usual treatment.

2. In a small series of cases with unfavourable age-grouping and generally coming under treatment at a fairly late stage the mortality was 37·5 per cent.

3. This mortality compares favourably with that reported in similar series in recent years in this country.

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BOILS AND CARBUNCLES AMONG MINERS.

BY S. W. FISHER, M.D. DUB.,
H.M. MEDICAL INSPECTOR OF MINES.

ATTENTION was recently drawn to the occurrence of boils and carbuncles among miners by the noticeable number of men at a certain colliery who were afflicted with them. Inquiries at this mine made evident various factors, any of which might have been the cause of the cases found. Of these factors three were outstanding: (*a*) the temperature at the working face—dry bulb 90° F., wet bulb 80° F.; (*b*) the hardness of the drinking-water; and (*c*) the fact that most of those suffering from boils were men who had been off work for terms up to two years and who were newcomers to the district. In order to determine more exactly which of these factors was the material one, 20 other collieries were visited and information received from 29 more. About 200 men were examined or interviewed.

A TWO-SIDED INVESTIGATION.

The investigation at the various collieries resolved itself into two parts—namely, examination of the men and examination of conditions at the mine. At each mine the following points were noticed: depth (shaft and workings where a marked difference existed), thermometer readings as given by the ordinary wet and dry bulb thermometer, type of coal, state of ventilation, and quality of drinking-water. The depths of the mines visited ranged from 300 to over 1000 yards, and the distances inbye to the working places up to 2½ miles. The highest temperature met with at the face was 93° F. dry bulb and 85° F. wet bulb; the lowest was 53° dry and wet bulb. In mines where the wet bulb temperature was about 75° or over the men worked partially stripped—i.e., shorts and boots—and the occurrence of boils was most noticeable in mines where the temperature at the face reached or passed this figure. I observed, too, that boils occurred more often on men who sweated profusely and whose bodies were covered with a fine wet film of coal dust—as one man put it, "the body is as if covered with boot polish."

On the whole ventilation was good; when it was noticeably otherwise a temporary cause, such as a fall of roof in an airway, or the extraction of water before the making of a new airway, was the explanation. Several Petri dishes containing a culture medium were exposed in the intake and return airways and at the working face in order to test the bacteriological purity of mine air, the exposure in some cases being for 15–20 minutes; in no case was any pathological micro-organism found.

Most types of coal were met with and, apart from the fact that some seams are hot and some coals generate a very fine dust which is more difficult to wash off completely (the men use soda in their baths), I have no reason to think that the composition of coal has any influence. As regards water underground, droppings from the roof sometimes cause smarting and irritation, especially severe when in bed at night. At one colliery a supply of vaseline was kept underground for the men to rub into their skin after working. A sample of such a water contained 186·51 parts per 100,000 sodium chloride.[1] The soaking of the skin through working in wet places lowers its vitality and facilitates the entry of staphylococci. This is well known to be a cause of prepatellar cellulitis (miners' beat knee).

THE FINDINGS.

I considered it of some importance to try to determine the position where the first boil started. In many cases this could be traced to a small scratch or injury; 10 cases started on the knee, and 8 of them might have been diagnosed as miners' knee, which is a compensatable disability. In other cases the original focus was: back (9), elbow and forearm (9), lower third of leg (7), fingers (5), wrists (5, 3 of them in surface workers), toe (1), buttock (3), face (4), axilla (2), shoulder-blade (1, a filler), neck (1), ankle (1), abdomen (1), and thigh (4). It is worth remembering that most men wear a belt, or a substitute, and none wears a collar. In many cases, but by no means in all, there was a likelihood of infection from house mates, the landlord, landlady, or another lodger having had them just before. Cases also followed one another in a given working stall.

At the first colliery to which my attention was drawn, where the complaint assumed its most serious proportions, of 12 men examined, 9 had only recently started work, having been idle for periods ranging from one month to two years, during which time they were living on their unemployment insurance. They became infected after an average of 7½ months at their work (one week to two years). On the other hand, boils were not common among the men of long-standing at the mine, and one is led to the supposition that a lengthy enforced idleness and probably poor nourishment causes lower resistance among the men. Similar observations have been made in the case of miners' beat hand and beat knee.

The hardness of drinking-water has sometimes been blamed for boils. This is a point that is not easy to decide. The water drunk by miners at the colliery where the greatest number of cases occurred was found to have 16° hardness, but a neighbouring mine with a similar water-supply had very few cases. A mine which had never had many cases and which had none at the time of my visit had drinking-water of 40° hardness. Again, at many mines boils occur only in certain stalls, although the drinking-water is the same for all. What may be of importance is the fact that many men in warm mines drink large quantities of water and thus lower the percentage of chloride in the blood fluid.

No mines having pithead baths, with one exception (where boils were very few), were reported as having cases of boils. In my opinion, pithead baths must be a valuable preventive.

As regards treatment, I recommend the use of manganese injections and treatment of the local lesion by painting it with contractile collodion.[2] To the managers of mines where boils occur I suggest that every effort should be made to improve the ventilation, lower the temperature, and minimise wetness. To the men my advice is to apply an antiseptic, preferably tincture of iodine, to the smallest scratch, cut, or boil, as soon as possible, and avoid touching the boil with the fingers, to drink as little water as possible, and preferably water that has a small amount of salt added to it (about 10 g. to the gallon), and whenever available to make full use of pithead baths.

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[1] Powdered oatmeal in the bath-water may be both a preventive and may help to cure. This is used a great deal for prickly heat in India—a condition which mostly occurs in the rainy season. In the rainy season people in India suffer from boils, usually a large number of small boils. These multiple boils often mean that a "prickly heat" rash has become septic —i.e., has become infected by the staphylococcus. Horses suffer from a type of ulcer, also during the rains. The Indians call it Barsati or Burrsati because it only occurs in the monsoon (Barsat). If a horse get a barsati sore, he will have an annual recurrence and will be free when the rains stop and the atmosphere becomes cooler and more dry. In the hot weather (up to 115° F.) the skin is dry; in the rains the temperature is between 80° and 90°F. and the skin is damp, if not actually streaming.

[2] See THE LANCET, 1930, i., 946.

CONCLUSION.

In conclusion, I am of opinion that as far as mines are concerned, boils do not present a serious problem, except in a few isolated cases, and that the main factor in the causation of boils underground (apart from the predisposition to them of the individual—e.g., malnutrition, seborrhœa, &c.) is a high wet bulb temperature (75° and over) which at one and the same time indicates suitable conditions (warmth and moisture) for the vitality of the organism and opens the sweat glands and hair follicles and thus facilitates the entry of the staphylococcus.

CLINICAL AND LABORATORY NOTES

TWO CASES OF DOUBLE GALL-BLADDER.

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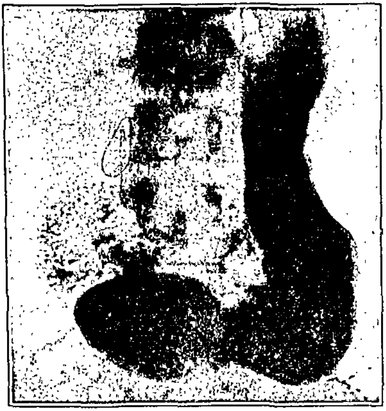
A DOUBLE gall-bladder is a rare developmental anomaly. A few cases have been found at operation and at post mortem, while only three have been discovered by radiography. All of these were reported in America. It appears that the following two cases are the first to be diagnosed by cholecystography in this country. From the clinical aspect they present no points of interest. Both were females aged about 40, with vague abdominal symptoms slightly suggestive of pathological gall-bladders. They are reported only because of the unusual radiographic appearance and on account of the rarity of the condition.

CASE 1.—Gall-bladder dye (Keraphen) was given by the mouth 16 hours before examination, and a barium meal was given at the time of examination. The stomach and duodenum were normal.

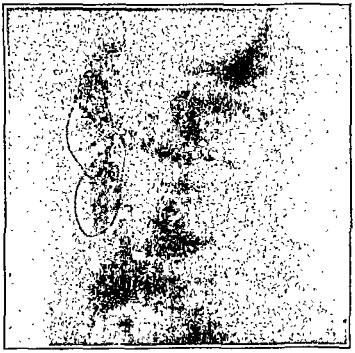
Two pear-shaped shadows are seen to the right of the second and third lumbar vertebræ (Fig. 1). The inner shadow is longer and wider and lies parallel with the spine. The axis of the smaller outer shadow forms a slight angle with the spine. The necks of both shadows converge to a point. On examination half an hour later the outer shadow was seen to be smaller and denser. Presumably this indicated reflex contraction of the outer vesicle. It was empty four and a half hours after the meal, while the inner vesicle still contained a residue of the dye. The lateral view (Fig. 2), taken at the first examination, shows that the inner vesicle lies slightly behind the outer vesicle. Their necks are on different levels, the distance apart being about the depth of one lumbar vertebra. The delayed emptying of the inner vesicle suggests that it may be pathological. The symptoms were, however, not severe and cleared up under medical treatment. No operation was performed.

FIG. 1.



CASE 1.—Antero-posterior view.

FIG. 2.



CASE 1.—Lateral view.

CASE 2.—*The same technique was followed as in Case 1,* but no barium meal was given.

The two shadows appear between the eleventh and twelfth ribs. In the antero-posterior view (Fig. 3) they overlap to a certain extent, so that the inner vesicle is partly obscured by the outer vesicle. The lateral view showed the inner vesicle lying (as in Case 1) slightly behind the outer vesicle. The inner vesicle emptied well after a fatty meal, but the outer vesicle contained a residue. This suggests that one gall-bladder may be pathological, but the symptoms were not severe enough to warrant an operation.

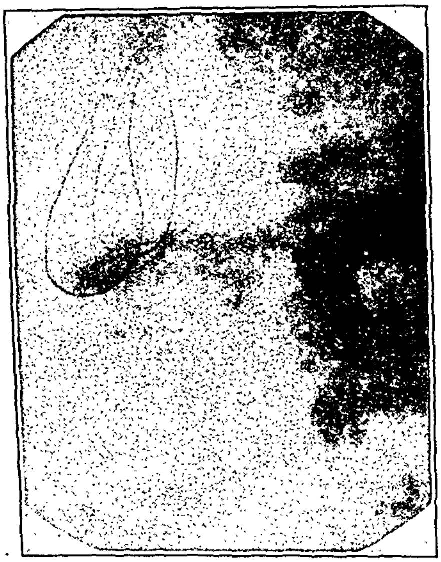
These two cases show a striking resemblance. Both patients had indefinite symptoms which were not severe enough to warrant operation. In both cases there was delayed emptying of the larger gall-bladder. Was one gall-bladder in each case enlarged as the result of chronic infection, or had it been larger than its fellow from birth? Does the presence of a double gall-bladder increase the risk of one or both becoming infected? Does the mutual pressure of the gall-bladders mechanically restrict the emptying of one of them, apart from infection? It is unfortunate that neither case was operated upon, as the result might have thrown light on these questions.

One may expect that, with the widespread use of cholecystography, other cases, both normal and pathological, will be recorded.

DISCUSSION.

The first mention in literature of a double gall-bladder occurs in "Philosophical Transactions" for the year 1693–94, where a certain Dr. Foot quotes a case of a woman, aged 31, having an enlarged liver and two gall-bladders, both distended with bile. He states that one gall-bladder was in the right lobe and one in the left lobe of the liver. In 1886 Purser[1] showed a case before the Academy of Medicine in Ireland. This was a girl of 11 years who had two gall-bladders, each with separate cystic ducts opening into the bile-duct. In 1911 Sherren[2] reported a case found at operation, in which the two gall-bladders were joined only along a narrow portion of their circumference and each possessed its own cystic duct.

FIG. 3.



CASE 2.—Antero-posterior view

More recently, Meyer[3] and Nichols[4] have also reported cases. In Meyer's case the two gall-bladders were joined over a broad area of their circumference and communicated by a narrow opening in their necks. A single cystic duct was present. Nichols's case was diagnosed before operation, as a radiogram showed a double cluster of stones. At operation the gall-bladders were found to be joined by connective tissue and each had its own cystic duct. Other similar cases are reported by Daever and Ashurst[5] and by Schachner.[6]

The first case of double gall-bladder diagnosed by cholecystography was reported by Climan[7] in America. The radiograms showed good concentration of the dye in both vesicles and normal reduction after a fatty meal. One gall-bladder lay behind and below the other. Both were reported as normal. Hayes[8] has described a similar case.

According to Boyden's[9] studies on 19,000 human subjects and 10,000 domestic mammals, the incidence of double gall-bladder is as follows: Humans, 1 in 3–4000; pigs, 1 in 198; sheep, 1 in 85; calves, 1 in 28; cats, 1 in 8.

The rarity of the condition in human beings accounts for the fact that Graham[10] did not find a single example in 1218 cases examined by cholecystography.

The mode of development of double gall-bladders is variously described by different authors. According to Keith,[11] the bud for the gall-bladder divides. Boyden, on the other hand, states that this mode only applies to cats and that in humans the supernumerary vesicles are derived either from the hepatic, cystic, or common bile-ducts. Boyden also describes another method of development which occurs chiefly in cattle and sheep: a vesicular outgrowth of liver trabeculæ enlarges to form a supernumerary gall-bladder. This type of development is the only one which can account for Foot's case of gall-bladders in the right and left lobes of the liver. Aschoff gives a completely different account. He states that normally the cells of the gall-bladder bud proliferate and give rise to a number of cavities, separated by septa. The cavities eventually fuse into one large cavity. When they fail to fuse, supernumerary gall-bladders are formed. With this type of development one would expect to find rare cases of gall-bladders having multiple cavities, and such have been reported by Daever and Ashurst,[5] Dévé,[12] and others.

The following classification of gall-bladder anomalies appears to be rational, as it is based on the supposed method of development, and is descriptive of the various types.

1. *Ductular gall-bladder.*—Derived from supernumerary vesicles from either the hepatic, cystic, or common bile-ducts. Two cavities are present, each having its own cystic duct.
2. *Bilobed gall-bladder.*—Formed by initial subdivision of the primitive gall-bladder bud. Two cavities communicate with the common bile-duct through a single cystic duct.
3. *Diverticular gall-bladder.*—Resulting from persistence of cavities and septa in the gall-bladder bud. One large cavity, communicating with one or more smaller cavities.
4. *Trabecular gall-bladder.*—A vesicular outgrowth of liver trabeculæ. Common in cattle and sheep, but of doubtful occurrence in humans. It would account for the presence of two widely separated gall-bladders.

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A METHOD OF INSERTING CONTACT GLASSES.

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OPHTHALMIC SURGEON TO THE MIDDLESEX HOSPITAL; SURGEON TO MOORFIELDS EYE HOSPITAL.

TWO communications have recently appeared in THE LANCET on the use of contact glasses, respectively by Mr. Rugg-Gunn[1] and Prof. Leopold Heine.[2] The former describes in detail what I conclude is the accepted method of inserting the glasses. The patient leans forward with his head in a horizontal position; the inverted contact glass, filled with saline, and kept level, is held by means of the rubber sucker in the surgeon's right hand, and is inserted between the lids which are held open with his left hand. By this method, to quote Mr. Rugg-Gunn, it is extremely difficult to avoid enclosing an air bubble between the eye and the contact glass; the air bubble is a sore trial because it may recur again and again, and there is nothing to be done but each time to take out the glass and start afresh. All this makes the preliminary trial of different glasses, which is essential in order to determine the fit and power required, extremely tedious to patient and surgeon. Prof. Heine criticises certain points in Mr. Rugg-Gunn's paper, but as he does not refer at all to the latter's description of the method of insertion, I take it that this meets with his approval.

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[1] THE LANCET, 1930, ii., 1067.
[2] Ibid., March 21st, 1931, p. 631.

Although my own experience of these glasses is limited to one patient, who, as it turned out, could not tolerate them, I feel that it is worth recording, mainly because I very soon found it possible, by using a different method, to insert the glasses quickly and easily.

The particular patient on whom I tried the contact glasses was a case of bilateral conical cornea, whose vision could be improved from less than 6/60 to 6/12 in each eye by concave sphero-cylinders, which, however, she found great difficulty in wearing, as she said they caused headache and giddiness. When she was wearing suitable contact glasses 6/9 vision was obtained in each eye, but in spite of the fact that the glasses selected appeared to fit the scleral curves perfectly, the patient could not tolerate them for longer than an hour at a time, and as there was no improvement after daily trial for a fortnight, I decided to abandon the attempt altogether. The patient was a highly nervous woman, and therefore perhaps not altogether a suitable case; apart from this, however, on each occasion the glasses caused congestion and irritability of the conjunctiva, which began soon after the effect of the local anæsthetic had passed off, and gradually became so intense that the patient begged to have them removed.

METHOD OF INSERTION.

The surgeon stands behind or beside the patient, who may either lie on a couch with his head on a low pillow, or may sit in a chair which supports the head with a headrest; the latter position is, if anything, the more convenient. Cocaine or holocaine having been instilled into the eye, the patient is told to look slightly upwards and inwards, and the empty contact glass, held by means of the sucker in the surgeon's right hand, is inserted into the lower fornix, the surgeon depressing the lower lid slightly for that purpose with his left thumb. With his left hand the surgeon now steadies the patient's upper lid in order to prevent blinking, and while he holds the contact glass close to the globe, but not quite against it, with his right hand, an assistant allows saline to drip from an undine into the space between the contact glass and the globe. The space becomes quickly filled (the fluid remaining in it by capillary attraction), and when this is accomplished the surgeon gently applies the contact glass to the globe, at the same time allowing the upper lid to fall over the upper margin of the glass. Removal of the sucker concludes the operation. This method not only obviates the formation of air bubbles, but can be repeated with rapidity and ease, so that a large number of glasses can be tried in succession in a very short space of time.

The only objection I can see to this method is the fact that the help of a second person is required, but although I did not actually try it, I have little doubt that it would be possible, with practice and dexterity, both to hold the upper lid with the little finger of the left hand, and at the same time to drip the saline from a conveniently shaped undine or pipette held in the palm of the hand, while holding the contact glass in apposition to the eye with the right.

When the patient finally inserts the glass himself, he must of course do it with his face in the horizontal position, looking downwards. One thing which surprised me was the comparative ease with which my patient eventually inserted the glasses herself, and that in spite of a very shaky hand. It is true that she never accomplished the feat without enclosing an air bubble, but I think that with a little more practice she would have done so.

With regard to the removal of the contact glass, I found that this was most safely accomplished by reapplying the sucker, and by slipping the glass off sideways to the outer side, while the patient looked in the opposite direction.

In the management of the case I received valuable assistance from Mr. E. F. King, one of the house surgeons at Moorfields Hospital, with whose help I evolved the method of insertion described above, and who inserted the glasses on the days when I did not attend at the hospital.

REMISSIONS AND RELAPSES ASSOCIATED WITH PREGNANCY IN MYASTHENIA GRAVIS.

BY L. P. E. LAURENT, M.B., M.R.C.P. LOND.,
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THE influence of pregnancy, and sometimes of the menstrual cycle, on the course of myasthenia gravis lends support to the view that this condition is largely, if not entirely, brought about by endocrine disturbances.

Grosse[1] has reported a case in which symptoms first developed during pregnancy and recovery took place after the induction of premature labour. Tilney[2] has also seen myasthenia gravis begin during pregnancy, and similar observations have been made often enough to exclude the possibility of chance. In contrast to this, remission of symptoms during pregnancy has been observed in many cases. Goldflam's remarkable case, in which three pregnancies were accompanied by remissions while parturition was on each occasion followed by a relapse, is one example. Of equal interest is Fearnsides's case[3] reported in 1916. The history of the latter, which is detailed below, shows a complete remission of symptoms during the first and second pregnancies and serious relapses in five subsequent pregnancies. The literature contains many cases of myasthenia gravis which have been observed for periods of 12 to 14 years. The cases with the longest histories are those of Collier[4] (two cases, 24 years each) and McKendree[5] (19 years). The case reported below has had undoubted symptoms of myasthenia for 29 years, and she has been under medical observation for 26 years.

A married woman, aged 40 years, was admitted to the Hospital for Epilepsy and Paralysis, Maida Vale, in 1916, under the care of Dr. George Johnston. She was presented by the late Dr. E. G. Fearnsides to the Neurological Section of the Royal Society of Medicine. The following account of the patient's history is in part reproduced from Dr. Fearnsides's notes.

Since 1899 she had suffered from typical attacks of major epilepsy, seven to eight attacks occurring annually. In 1902, while still single, she one day noticed difficulty in speaking and on the next day she complained of severe headache and dysphagia. These symptoms cleared up in the course of a few days, but have since recurred to a varying extent on many occasions. About Christmas, 1903, she was in bed for the six days preceding her wedding, owing to the weakness of the arms and legs; this subsequently disappeared completely. She was in good health whilst carrying her first child, who was born in February 1905, after a remarkably rapid labour. She first came under observation in 1905 at the London Hospital, when six months pregnant of her second child.

In 1905 she weighed 8 st. 7 lb. No abnormal signs were detected in the heart, vessels, lungs, abdomen, and urine. No enlargement of the thyroid or thymus could be detected clinically. She complained of failure of the voice after talking for some time, dysphagia, diplopia, and unilateral right-sided headache which came on in attacks, preceded by a pricking sensation starting in the left foot and spreading upwards over the whole body. On examination the positive findings were as follows: The voice was nasal. The speech tired easily, the voice disappearing completely in the course of conversation. Ptosis was present occasionally. Varying degrees of external ophthalmoplegia were observed at different examinations. Weakness of the orbicularis oculi was constant. Whistling was impossible and the cheeks could only be blown out for short periods. The palate moved well at first but ceased all movement after five to ten deep breaths. Protrusion of the tongue, normal at first, became impossible after 5 to 15 repetitions. Dysphagia of varying intensity was present, nasal regurgitation taking place when she was at her worst. The limb musculature tired easily and the myasthenic electrical reactions were obtained. At times she found walking impossible.

On Jan. 28th, 1906, she was delivered of a healthy daughter after a rapid labour. Towards the end of the pregnancy there had been a complete remission of all symptoms. Dysphagia, diplopia, and nasal voice recurred on the eighth day after delivery. A gradual improvement took place later. In 1907 she had a six-months miscarriage. Relapse occurred at the beginning of this pregnancy. Nasal regurgitation and dyspnœic attacks were particularly frequent in the later months of pregnancy. Miscarriage was followed by a gradual improvement.

In 1909 a five-months miscarriage of twins again brought to an end a severe relapse which had taken place during pregnancy.

In 1914, when six months pregnant, she was unable to sit up in bed, and suffered from nasal regurgitation and dyspnœic attacks. On this occasion the artificial termination of pregnancy was followed by a rapid improvement. In 1922 she had a five-months miscarriage, and in 1926 another at three months. She relapsed again during the pregnancies, and improved considerably after miscarriage, particularly since 1926, as will be seen from the account of the present condition given below.

On Jan. 31st, 1931, she was a stout woman weighing 12 st. 7 lb. Her face had a fatigued expression but at rest no special muscle group could be incriminated. There was a slight degree of ptosis, easily compensated by overaction of the frontalis and not increasing with exercise. She had not experienced diplopia during the last four years. On examination the ocular movements, at first of full range, soon became impaired on repetition. Upward movement of the right eye and outward movement of the left eye were most affected, strabismus and diplopia resulting. Bilateral facial weakness was revealed when she attempted to retract the upper lip, and there was definite weakness of the orbicularis oculi, closure of the eyes being impossible when the slightest resistance was offered. The tongue could not be protruded more than half an inch beyond the teeth, but repetition of that movement ten times did not give rise to fatigue. There was no wasting of the tongue. There had been no dysphagia and no dyspnœa for four years. Of the muscles of the limbs and trunk, only the deltoids tired in the course of examination. She walked up and down three flights of stairs, talking volubly all the time, and experienced no difficulty beyond slight dyspnœa, within normal limits for a woman of her age and stature. The tendon reflexes were all present and rather brisk, and the plantar responses flexor. No abnormality was detected in the chest or in the abdomen. The thyroid and the thymus showed no signs of enlargement on clinical examination.

She menstruates regularly, her periods lasting three days and recurring every three weeks—her normal cycle. It is interesting to note that the intensity of symptoms has never had any relation to the menstrual cycle, although it has been so obviously related to pregnancy. The miscarriages are satisfactorily accounted for by a prolapsed uterus, for which she underwent colpoperineorrhaphy in 1928.

The ease and rapidity of labour noted in this case has already been reported in myasthenia. In Tilney's case, already referred to, labour lasted five hours and a half in a primipara, and I have notes of a case of myasthenia gravis in which a first labour was completed within five hours of the onset.

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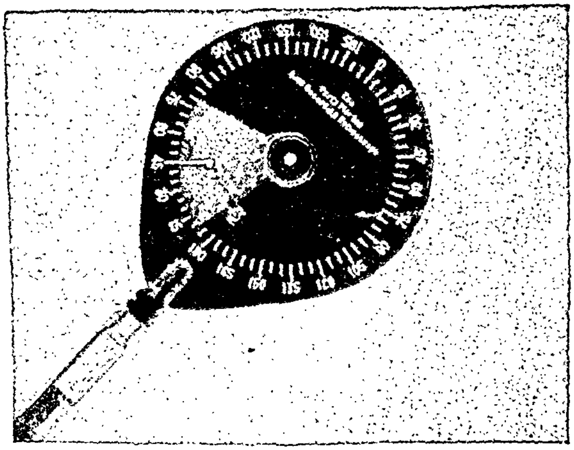
NEW INVENTIONS

AN IMPROVEMENT IN RETINOSCOPES AND OPHTHALMOSCOPES.

THE purpose of this device, shown in the illustration, is to make retinoscopes and ophthalmoscopes self-recording by means of an apparatus for registering the meridians in retinoscopy. At the back of a retinoscope or ophthalmoscope and along its circumference are marked a scale of the various meridians. At the back also there is attached a section movable about a pivot situated around the aperture in the centre. This section is in the form of a triangle with its base slightly curved and carrying with it an indicator which serves to make the above-mentioned scale of meridians at the circumference. Furthermore, this triangular section is conveniently weighted so that it will move in accordance with the position of the retinoscope or ophthalmoscope when in action, but comes to rest when the instruments are tilted forward for the purpose of noting the position of the indicator on the scale of meridians. In this connexion a spring and knob may be utilised, or any other suitable device, to lock the indicator in position.



The manufacturers are The Elliott Optical Co., Ltd., 104–5, Great Saffron-hill, London, E.C.

R. S. McCLELLAND, M.D., Ch.B. Edin.

LONDON LOCK HOSPITAL.—The Lord Mayor of London recently opened an extension of this institution in Dean-street, Soho. The enlargement, which has cost over £22,000, of which some £5000 remains to be raised, includes new consulting-rooms, a new dispensary, a new intermediate treatment department, and a dining-room for the staff. Last year there were 90,000 out-patient attendances.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE.

SECTIONS OF COMPARATIVE MEDICINE AND EPIDEMIOLOGY.

AT a combined meeting of these Sections held on March 25th, with Prof. G. H. WOOLDRIDGE, F.R.C.V.S., in the chair, a discussion on

Milk-borne Epidemics Due to Streptococci

was opened by Dr. W. G. SAVAGE. Streptococci, he said, were extremely common in milk, and were derived from many sources. Their presence, even in very large numbers, was no evidence that the milk so infected was harmful. Even the demonstration of hæmolytic streptococci, he declared, was inadequate evidence of potential infectivity, and it was difficult to give any series of tests of a bacteriological nature by which to determine the infectivity of the streptococci in milk. On the epidemiological side, however, the ground was more definite, for two types of infection, both due to streptococci, had been shown many times to have been propagated by milk consumption. These types were scarlet fever and angina (sore-throat), and they were met with in various degrees of malignancy. The possibility of a human and a bovine origin had to be considered in regard to both. In 1912, after examining all previous records of alleged bovine scarlet fever, he arrived at the conclusion that the cow was the probable carrier of the organism in these epidemics, but in a purely passive capacity, showing in itself no disease symptoms. The view that the Hendon outbreak was spread by locally infected cows explained all the essential facts and reconciled conflicting ideas. The next investigation along this line was made 16 years later by F. S. Jones and R. B. Little on a scarlet fever outbreak in New Jersey State, U.S.A. Here were scarlet fever cases on the farm, but one of the cows was found to have an injury to the teat and suffered from mastitis being present with abundant hæmolytic streptococci of the human type in the secretion. It was found possible to infect other quarters of this cow, as well as another cow, with the streptococcus and to set up severe mastitis. In another paper Jones stated that milk which had been heated to 58° C. for 20 minutes, or which was passed through a coarse Berkefeld filter, had the ability to inhibit the growth of the scarlet fever streptococcus. This, said Dr. Savage, confirmed his view that in milk-spread scarlet fever the agency of an infected cow must be considered possible.

In epidemics of angina the epidemiological facts were these. From 1890 to 1910 a number of outbreaks, all milk-borne, were reported in Great Britain. A typical example was that at Colchester in 1905, when 96·6 per cent. of the 600 cases were traceable to the milk of one distributor, who received his milk from five sources. On one of the farms a cow was found to be suffering from streptococcal mastitis. Exclusion of this animal's milk from the town's supply caused the epidemic to cease. It was remarkable, he said, that since 1910 there was no reported milk-spread angina until the Hove outbreak of last year. In the United States no outbreaks were reported until 1911 but many since then. C. L. Scamman enumerated 87 milk-borne outbreaks of scarlet fever between 1893 and 1928, and 45 milk-borne outbreaks of septic sore-throat between 1908 and 1928; 55 per cent. of the latter were attributed to a milk handler, 30 per cent. to a diseased cow and a milk handler.

Much work had been done to elucidate the bacteriology of bovine mastitis and the cause of these anginal outbreaks. In 68 per cent. of his cases of bovine mastitis (1906–09) he found the *Streptococcus mastitidis;* he then discovered this strain in quarters clinically sound in 84 per cent. of cases, these quarters rarely being subsequently involved, while to naked-eye appearance the milk of these quarters was unaltered. He found that the bovine type of streptococcus was non-pathogenic to mice, and to laboratory animals generally it was of low virulence, though it readily set up mastitis in goats when introduced into the teat canal without damaging the mucosa. The human types were pathogenic to mice. He felt so sure that *S. mastitidis* was not a cause of human disease that on two occasions he swabbed his own throat with massive doses of it from a recent case of cow mastitis, and suffered no effects; it was moreover difficult to recover, showing that the human throat was an alien habitat. From these and other experiments Dr. Savage in 1911 elaborated the hypothesis that ordinary bovine mastitis and teat lesions were harmless to man but that occasionally the local infection was due to implantation of organisms of human origin. The cow in this class of infection is only potentially pathogenic to man when it acts as an active or passive carrier of organisms of *human* origin. All subsequent work has tended to confirm the truth of this hypothesis. In an outbreak of sore-throat in Chicago in December, 1911, and the following month, in which over 10,000 persons were affected, D. J. Davis had emphasised the point that hæmolytic streptococci were responsible, differing from the type associated with bovine mastitis. Davis and Capps had shown experimentally that hæmolytic streptococci of human origin, when introduced into the cow's udder in large numbers by means of a catheter, could produce mastitis.

Dr. Savage expressed the hope that later speakers would say whether they were satisfied that existing methods were adequate to distinguish definitely between types harmless to the human, and those which set up in man angina or scarlet fever. Ample evidence was available that milk could be a vehicle for two kinds of streptococcal infection—namely, scarlet fever and angina. It seemed clear that the cow only served as an infective agent when the streptococci were initially of human origin, implanted on the cow's teats, or introduced into the udder.

BOVINE MASTITIS.

Mr. F. C. MINETT, M.R.C.V.S., spoke particularly of streptococci in bovine mastitis indistinguishable from the human *Streptococcus pyogenes.* As in many outbreaks of disease suspicion fell on the cow, it was important to consider the infections of the milk-producing organs. For the present discussion, as well as agriculturally, the most important of these was the mastitis due to streptococci. It was very prevalent. At the Royal Veterinary College, Camden Town, there had been occasion so far to examine, by blood-agar plating, milk samples from 1103 cows belonging to 20 herds. Of these cows 444 (or 40·2 per cent.) showed infection in at least one quarter of the udder, the incidence varying between 11 and

65 per cent. in the various herds. In the great majority a streptococcus was present. Five of these herds would have been classed as "clean." In most cases the disease was occult, no changes were obvious in the milk, and clinical examination was inconclusive. Mastitis in cows could be caused by hæmolytic or non-hæmolytic streptococci, but on the present occasion there was need to consider only the kind referred to by J. H. Brown as beta *hæmolyticus*—i.e., those which produced a distinct zone of clearing around deep colonies in blood-agar plates. There were, said Mr. Minett, three characters common to the great majority of udder hæmolytic strains, and these features served also to distinguish them from *S. pyogenes* of human sources. The first was their lack of pathogenicity for laboratory animals such as mice and rabbits, and the fact that they were not dangerous to man. Secondly, when grown in lactose broth for five days, considerable quantities of acid were produced, so that the final pH came to rest at 4·4 to 4·8. The third character was the ability of udder streptococci to hydrolyse sodium hippurate to glycol and benzoic acid. Up to the present time his laboratory had been in touch with 13 cases of mastitis whose udder secretion had yielded hæmolytic streptococci with characters different from those of cocci ordinarily found. In at least nine of those cases the streptococci appeared to be the cause of the mastitis, their numbers varying from several hundred thousand to eight millions per c.cm. These strains were exceptional in the relatively large amounts of hæmolysin they produced, and their high pathogenicity to mice and rabbits. No other conclusion seemed possible than that in these cases the cow's udder was infected with streptococci from a human source, very likely from the milker; yet seldom could human disease be identified. The power of these particular strains to produce mastitis had been tested by injecting 1 c.cm. of a 24-hour serum broth culture into the udder of a lactating cow via the teat canal; an acute mastitis ensued, leading to a drying up of the milk secretion and atrophy of the quarter during the third week.

Dealing with the part played by the cow in milk-borne streptococcus epidemics, Mr. Minett said that the hypothesis which Dr. Savage put forward in 1911 (and which he had repeated to-day) was suggestive, and the investigations which had been carried out in America could be held to have proved that the cow had played a major part in some of the epidemics. At the moment the important question was whether the proportion of outbreaks in which the cow was to blame was large or small; his own view was that the extent of the danger was usually under-estimated, and for this view he gave a number of reasons. Why did not such outbreaks occur more frequently? He suggested that their rarity might be not solely due to the fact that most udder streptococci were of the bovine type, but might be due in part to the fact that the human hæmolytic streptococci, which were not infrequently implanted in the udder, were of a type or in a life-cycle phase which was relatively harmless to man. Even when the streptococci in the udder were of a type known to be harmful to man, they did not always cause epidemics.

In conclusion he emphasised the desirability of defining more clearly the part played by the cow. The initiative must rest with the medical officer who was brought into touch with the outbreak. If, when a particular farm could be incriminated, the medical officer would communicate with the Research Institute of the Royal Veterinary College, the opportunity of making a bacteriological examination of milk samples from the cows would be welcomed. Their findings could then be correlated with those of the medical bacteriologists.

THE HOVE OUTBREAK.

Dr. E. **WILKINSON** (representing the Ministry of Health) said that in the recent Hove outbreak a considerable time elapsed before the matter was brought to the notice of any health authority, and so the investigations were begun at a late stage. Clearly that was a case in which human streptococci had been implanted into the milk channels of the cow. Enormous proliferation occurred and lasted several weeks, in fact about the same time as an epidemic of tonsillitis. In this Hove outbreak over a thousand cases occurred, and more than sixty deaths. Not until the end of December, though cases of tonsillitis were reported months earlier, was it reported that nearly all these patients were customers on one particular milk round. Samples of milk were found to be crowded with streptococci. There was strong reason for suspecting that the origin of the Hove epidemic was outside this country, as a bailiff of the farm had been visiting a house of illness and had probably brought the infection to the farm. This bailiff had certainly been in contact with cases of tonsillitis.

Mr. A. W. **STABLEFORTH**, M.R.C.V.S., spoke on the possibility of finding a method of distinguishing bovine from human streptococci by serological methods. He had examined 104 strains of streptococci from the bovine udder, and had more recently compared these with 50 strains of human origin. Of 46 bovine strains of hæmolytic streptococci which he examined, 25 fell into one very definite type similar to that of human *hæmolyticus*. Sixteen beta hæmolytic strains were notable for the fact that they caused wide zones on blood-agar plates, and caused a marked degree of lysin in broth, and were pathogenic. The beta hæmolytic strains which he examined had common group antigens, and were distinct from other bovine strains which he had examined. They also showed some common group agglutinins with human strains of *Streptococcus pyogenes*. The majority of streptococci from the bovine udder were distinct from human streptococci, but there occurred in the bovine udder members of the group which had some antigens in common with streptococci of human origin. The likeness he had observed was only a group likeness, not a specific one.

Prof. G. H. **WILSON**, M.D., referred to the Hendon epidemic, and remarked that the disease broke out later in Wiltshire, where cases of septic sore-throat occurred. It was highly probable, he thought, that streptococci from the throats of human carriers on the farm were implanted on the ulcers of the cows teats. He referred to two cases in which cows' teats yielded the diphtheria bacillus. Milk-borne epidemics or outbreaks of septic sore-throat and scarlet fever seemed to have been less common during the last 20 years than formerly.

Mr. **SIDNEY VILLAR**, F.R.C.V.S., said he was conversant, as the veterinary surgeon concerned, with the Hendon outbreak, and he agreed with Dr. Savage that the cow was a passive carrier. The cows concerned in that epidemic did not suffer from mastitis as ordinarily understood; they were infected with cow-pox, but not true variola. The vesicle was broken down by milking, and continued milking resulted in severe ulceration; 50 of the 70 cases concerned in the Hendon outbreak had teat sores. In the home of one of the milkmen a girl had scarlet fever. As there were few human cases of infection from milk, and cow mastitis was very common, he did not think the latter could constitute a great danger to the human subject. It was customary to discard milk which came from the infected quarter and to use the milk from the remaining three-quarters, if inspection showed it to be apparently sound.

Dr. **Wilkinson** referred to an epidemic in which investigation revealed that some people in the neighbourhood had scarlet fever, others tonsillitis, while from some who were tested there was obtained a hæmolytic streptococcus though they had no symptoms; the latter included the proprietor of the milk business who subsequently desquamated.

The **Chairman** agreed that it was fair to implicate the sores on the teats of cows in these epidemics, even when there was no actual mastitis. This teat condition was very common in cows; it was a form of impetigo. Cows frequently showed the teat condition soon after calving. He was once an unwilling demonstrator, among others, of the truth that milk even with a high content of streptococci from cows with mastitis was non-infective. He was one of eight persons who were drinking milk from a particular cow. One day he noted an unusual salty taste, and on investigation the milk was found to be teeming with streptococci. Yet no illness followed.

REPLY.

Dr. **Savage** expressed his gratification that the views he advanced in 1911 were now accepted as current knowledge. He considered that one important factor determining whether an epidemic would occur was the dosage of the virus or microbe. In one case he found that when the dilution of the milk from the infected farm fell below a certain figure, no fresh cases of human infection occurred.

SECTION OF UROLOGY.

At a meeting of this Section on March 26th, Mr. S. A. **Macdonald**, the President, took the chair, and a demonstration on principles and new advances in

Excretion Urography

was given by Prof. A. **von Lichtenberg** (Berlin).

The study of over 2000 cases and of seven intravenous contrast substances had, he said, enabled him to formulate the scientific principles of excretion urography. Five of the contrast substances were now reported for the first time; of these D40 (uroselectan B) had decided advantages; its administration was well tolerated, and excellent visualisation of the urinary tract was obtained after injecting 15 g. dissolved in 20 c.cm. of water. The new method had greatly clarified conceptions of the pathology of the urinary tract. Besides revealing anatomical changes, it gave a picture of the disease in all its physiological details. The urinary tract could be studied as a physiological entity; "system pathology" rather than "organ pathology" could be stressed. It was important that the eliminated quantity be enough to give satisfactory visualisation. The absolute quantity of the substance eliminated had no great influence on its applicability for excretion urography; its usefulness depended neither on the proportion eliminated through the kidney nor on the distribution in the body. It was important only that the quantity eliminated through the kidneys appeared in the urine as quickly and as concentrated as possible. The accompanying diuresis played an important part, since it influenced the concentration of the substances in the urine. Of the two substances on the market—abrodil and uroselectan—86 per cent. was eliminated in the urine, and of the other new substances tested—D34, D40, D50, B1015, and Sch122—the proportion secreted varied from 56 per cent. upwards. Of D40, 64 per cent. was eliminated, the maximum appearing half an hour after administration and elimination continuing for eight hours. The highest concentration of abrodil and uroselectan occurred three quarters and one and a quarter hours after injection respectively. The highest concentration was achieved by D40, 15 g. of which produced a concentration of 7·94 per cent., whereas 30 g. of uroselectan only produced a concentration of 4·4 per cent. The diuresis with D40 was 84 c.cm. at the first hour and 282 c.cm. in four hours, whereas with abrodil and uroselectan the figures were 175 c.cm. and 495 c.cm.; 120 c.cm. and 650 c.cm. respectively. The kidney capacity did not depend entirely on physical factors; chemical qualities also played a part. This was shown by the relation between the molecular weight of the substance injected and the concentration of the resulting urine. A large amount of iodine was not necessary for excretion urography; D40 contained about a fifth of the iodine that had previously been necessary. Good solubility and high iodine content were only relatively important; the absolute usefulness of the substances rested on a group of factors, some of which were still unknown. Work was being done on the isolated kidney in an attempt to improve the substances and discover these factors. Apart from toxicity, the most important element seemed to be elimination; not the amount given, but the amount eliminated determined success.

CLINICAL APPLICATION.

Dr. P. B. **Hughes** showed a large series of X rays from Prof. von Lichtenberg's clinic comparing pyelograms and excretion urograms and showing clearly that pyelography is apt to reveal a pelvis distorted by the pressure of the injection, while excretion urography shows the normal pelvis and its constant changes under the influence of peristalsis. The excretion method failed, however, when the kidney was damaged in the glomerular region. Purulent infection inhibited visualisation by this method, which was therefore a means of testing the function of the kidney. Thus anatomy and physiology, pyelography, and excretion urography, completed each other. Both failed, however, when a mechanical factor made filling from below impossible, and at the same time a physiological factor prevented filling from above. There were three groups of cases in which excretion urography gave exceptionally good visualisation, while instrumental pyelography failed to give the necessary information. In some of these the catheter method failed altogether; in others it gave defective pictures, and in others it caused diagnostic difficulties which could be cleared up by the complementary method. Pyelography failed, for instance, in cases of tumour with ureteral obstruction, but excretion urography showed the enlarged and deformed pelvis. Pyelonephrosis was shown by spherically dilated and fixed calyces. Excretion urography helped the surgeon to decide whether to adopt conservative or radical methods, as it gave an estimation of the function and emptying power of the kidney. In another group of cases the irritating fluid of the pyelogram might cause local cramp, so that one calyx perhaps remained unfilled; the fluid injected intravenously was not irritating, and could, therefore, fill all parts of such a kidney. In tuberculosis it might be impossible to get a catheter in, and even cystoscopy might be dangerous. Excretion urography was, therefore, particularly welcome.

If no visualisation of the kidney was obtained, and tubercle bacilli were found in the urine, no further investigation need be made. In hydronephrosis pyelography would not give a true picture of the size of the pelvis on account of irritation, but excretion urography showed it exactly, together with all the phases of emptying.

URETER, BLADDER, AND ADNEXA.

The normal ureter was never completely outlined by excretion urography on account of peristalsis. The whole tube was only seen when peristalsis was impaired or retarded. The interpretation of ureteral pyelograms was still unsatisfactory, and excretion urography was therefore particularly helpful. It would even show the slight changes produced by the passage of a small stone. It revealed slight degrees of atony and irritation. It distinguished between an actual kink and one that might be produced by a catheter in the pyelogram. A real kink was always seen in the same place in any number of excretion urograms. If the ureter was fixed, it failed to show pendulum movements, though its peristalsis might at first be unimpaired. Excretion urography showed up many stones that were not seen on an ordinary X ray, and the X ray showed stones which excretion urography did not reveal. Adnexal disease produced characteristic changes in the ureter. In prostatitis a slight atony of the ureter was revealed by filling of the lower part without dilatation. Later this went on to dilatation and tortuosity. Both sides were affected, but not necessarily equally. It was often possible to avoid cystoscopy and catheterisation if excretion urography were used in prostatic hypertrophy. A very dilated ureter might empty well, provided there were no obstruction lower down the tract.

The method was also useful for the bladder; carcinoma of the prostate would show as a displacement of the shadow with retention in the ureter and concentration at the point of torsion. Diverticulum of the bladder was well shown.

Mr. FRANK KIDD said that D40 would shortly be on the market in 20 c.cm. ampoules. He congratulated the Society on the honour Prof. von Lichtenberg had done it in electing to make the first announcement of his important discovery in this country at a meeting of that Section.

TUBERCULOSIS ASSOCIATION.

A MEETING of this society was held at Oxford from March 26th–28th, and will receive extended notice next week. After the annual meeting on the 28th, at which Prof. S. LYLE CUMMINS was re-elected president, a cinematograph film was shown illustrating

Thoracoplasty.

The film, taken by Messrs. Kodak, is divided into two parts, and shows the various stages of the operations of phrenic avulsion and thoracoplasty as performed by Mr. H. Morriston Davies. The accompanying legends explain each stage of the various procedures, as described by Mr. Davies in his book "Surgery of the Lung and Pleura." Mr. Davies relies entirely upon local anæsthesia in performing phrenic avulsion, 10 c.cm. of a 1 per cent. solution of novocain with adrenalin being sufficient to infiltrate the superficial and deep tissues, while in performing thoracoplasty he uses just enough chloroform to make the patient unconscious. A 1 per cent. solution of novocain with adrenalin hydrochloride 1 in 1000 is used for the local and regional infiltration.

Gelatino-thorax.

DR. J. CROCKET, in a paper on Gelatino-thorax, said that the introduction of oil or paraffin into the thorax had serious disadvantages, since they must be regarded as foreign bodies. Thus, in apicolysis, an operation now seldom performed, the paraffin used was extruded or formed a nidus of infection. He admitted that oleothorax was useful in stiffening the mediastinum, but in general he had found it disappointing. His patients brought up the oil through the bronchi, complained of its weight, or suffered from dyspnœa, digestive troubles, or effusions. A substance was required which, being of animal origin, would freely intermingle with a fluid effusion if present, and likewise an antiseptic that would act in the presence of serum. Such a combination was gelatin 2–5 per cent. with neutral Acriflavine 1 in 2000 to 5000. The acriflavine could be safely left in closed cavities, and its antiseptic effects, which greatly exceeded those of perchloride of mercury or phenol were increased in the presence of serum. Whereas Gomenol had been found to have no marked effect upon the tubercle bacilli in effusions, acriflavine greatly reduced the bacterial content. His technique was as follows: the gelatin was dissolved in normal saline and sterilised in an autoclave. The neutral acriflavine solution was boiled. The mixture should be freshly prepared for each case. It was desirable to test the idiosyncrasy of each patient and give small doses—e.g., 10 c.cm. at first. He used a blood-transfusion syringe with a two-way stop and rubber tubing arranged so that the effusion could be withdrawn and the gelatin-acriflavine solution be injected through the same needle. The gelatin was heated to 103° F. and injected slowly through a small needle and well below the level of the fluid, if this was not drawn off; 10 to 20 c.cm. were given at first, and if no reaction occurred the amount was increased to 200–300 c.cm. He had had several cases where no further injections were required after a single dose of 2–6 oz. An alternative method was to empty the pleural cavity, replace the fluid with air, and then inject the gelatin and acriflavine. After each syringeful the pressure should be noted, and should ultimately be below zero level. At the conclusion of the injection, pressure should be made at the site of puncture, the patient should lie on the opposite side, and avoid talking and coughing. The outstanding indication was an effusion rich in tubercle bacilli or secondarily infected, with fever, &c. It was also useful when there was a cavity, to sterilise a pleural cavity before thoracoplasty, and in basal bronchiectasis. He did not favour interference where there was an effusion and no symptoms, believing this to serve as a good natural splint.

In the subsequent discussion, Dr. M. GILBERT (Leysin) agreed about the disadvantage of oil in not mixing freely with the pleural contents, but defended oleothorax as a valuable procedure in suitable cases. Secondary infections of the pleural cavity were not its best indications. In eight years' experience he had never had a perforation of lung, and considered this due to faulty technique. A too high pressure in malignant pleural effusions was apt to enlarge existing perforations. He had found oleothorax to decrease the bacilli in effusions. A further advantage was the ability to see the formation of fluid when oleothorax was used for obliterative cases.

The session concluded with an exhibition and demonstration of radiograms by Drs. G. T. Hebert, G. Jessel, and A. J. Morland.

LIVERPOOL MEDICAL INSTITUTION.

AT a meeting of this Institution on March 10th, with Mr. G. C. E. SIMPSON, Vice-President, in the chair, a paper on

Removal of Tonsils and Adenoids

in subacute rheumatic heart disease was read by Mr. P. W. LEATHART. The 50 cases chosen for operation were in-patients at the Liverpool Heart Hospital. All showed fever for a long period before operation, and one or more cardiac lesions. Operation was performed on the assumption that the patient was a carrier of the infection in his tonsils and adenoids. On this assumption the size of the tonsil was not important; the presence of enlarged glands in the anterior triangle of the neck was more significant inasmuch as it was clinical evidence of absorption of poison. Removal of the tonsils could do no more than prevent further absorption. The patients had been under observation for long periods, sometimes as long as four years. In 16 cases the temperature finally became normal and stayed normal; in 20 the cardiac condition became stationary; in eight there was improvement in it; in the rest it was not possible to give an opinion; in all except one the relatives were emphatic that the general health had improved. The question arose, said Mr. Leathart, whether the tonsils were front-line barriers to infection, or open doors for the purpose of admitting disease. The latter view was the more reasonable for it was known that all tonsils and other external lymphoid masses such as Peyer's patches and solitary follicles contained organisms even in health. It was probable therefore that in health poison was being absorbed from them, the object being to establish or keep up immunity. If the immunity was at a low ebb or failing, more poison was absorbed than could be dealt with, and the patient was in danger. In such cases if there was evidence, such as enlarged cervical glands, that the tonsil was the open door through which poison was entering, the door should be shut by its removal.

Mr. COURTENAY YORKE pleaded for a more conservative attitude towards the tonsils. He thought local infection in the tonsil a very uncommon cause of systemic disease, and he believed that the tonsils were sacrificed far too often in the mistaken belief that they were centres of auto-infection. The tonsillar crypts were lined by stratified epithelium which afforded an effective barrier to infection. The presence of cheesy material in the follicles was very common and could not be regarded as pathological. In adults the operation of tonsil dissection, under a general anæsthetic, was a severe one and fraught with obvious dangers. It should therefore be performed with caution, especially in the type of case where the tonsils were condemned on the supposition of auto-infection.

Mr. H. V. FORSTER was doubtful whether the lymphadenoid tissue of the pharynx and post-nasal space was really an open door through which the individual invited combat and was content to prove victorious or to be eliminated on the result of the fight. It would be better, of course, that the invader should be arrested in a front-line engagement, rather than admit a serious conflict with the deeper-placed reserves, and it was interesting to know that Kaiser had recently recorded how in a large group of American children deprived by operation of the familiar masses of lymphadenoid tissue of the upper respiratory and food passages, there was a greater incidence of bronchitis and pneumonia than in controls.

Dr. ISAAC HARRIS testified to the accuracy of Mr. Leathart's findings. There were some cases, he said, which without a shadow of a doubt benefited by tonsillectomy; there were others in which we might be equally sure that the operation was useless. In the great majority of cases it was difficult to say one way or the other. The important thing was that some cases of rheumatic heart certainly derived considerable benefit from the operation. The danger of operating was easily exaggerated. As long as there was no gross damage of the heart muscle the cardiac case usually stood an operation as well as the normal case.

Mr. E. MALCOLM STOCKDALE held that the structure of the tonsil was such that it constituted a weak spot, readily becoming infected and liable to disseminate disease. Few people escaped an attack of tonsillitis. As the treatment of adenoid and tonsil disease had progressed, the number of cases of enlarged glands (tuberculous) in the neck had greatly diminished, as also had Pott's disease of the spine. The size of an infected tonsil was no indication of its power for evil, a small red buried tonsil being more dangerous than the greatly enlarged pale protruding tonsil.

Technique of Inhalation Anæsthesia.

Dr. R. J. MINNITT read a paper in which he described the McKesson Nargraf apparatus and explained the technique of inhalation anæsthesia with the face mask, and also with de Caux's intratracheal catheters. He had had experience in over 200 cases, including almost every kind of operation. The advantages were the comfort and speed of induction, the minute quantities of ether used, the absence of cyanosis, the speedy recovery, the reduction of post-anæsthetic vomiting, and of the taste or smell of ether, and the freer atmosphere in the operating theatre from ether exhalations. The evidence, he said, was much in favour of rebreathing, the addition of carbon dioxide to the anæsthetic gases, and the elimination of ether as far as possible in renal disease.

Dr. JOHN HALTON inquired what preliminary medication Dr. Minnitt gave before gas-oxygen anæsthesia; he thought that the success of any anæsthetic depended largely upon the patient's condition immediately before the induction. He had recently perfected a technique which for open ether anæsthesia required the average use of only 8–12 oz. of ether for the first hour of major operations. In roughly 300 recent cases in which the anæsthetic was administered in this way as a hospital routine, compared with 100 by ordinary methods, the difference in post-operative comfort and absence of complications was very marked.

Mr. H. C. W. NUTTALL supported the statements made about the efficiency of the McKesson Nargraf apparatus and the absence of post-operative respiratory complications. Provided cyanosis was avoided there was probably no greater hæmorrhage than with open ether, but this question was difficult to decide, for patients varied whatever type of anæsthetic was used. He thought that if this method was found to be superior to others in hospital then its use must be extended to private practice, but here its cost and the bulk of the apparatus raised difficulties. He did not agree that it should be reserved for specially difficult cases; routine use with all types of case was essential for perfecting technique.

Dr. W. J. BENNETT JONES remarked that Dr. Minnitt had mentioned gas and oxygen as the ideal anæsthetic and that he gave a little ether as well, from ½ to 4 oz. The speaker looked forward to the day when nothing but gas and oxygen would be given except in rare cases.

EDINBURGH OBSTETRICAL SOCIETY.

At a meeting of this society on March 11th, Dr. H. S. Davidson, the President, took the chair, and a paper concerning the

Urinary Tract in Carcinoma of the Cervix

was communicated by Mr. Henry Wade and Mr. David Band. Two autopsy reports were given as illustrations of the end-results of extension of carcinoma of the cervix uteri so as to involve the urinary tract. In one the carcinoma had involved the bladder and one ureter. A vesicovaginal fistula was present, and involvement of the ureter had brought about atrophy of the kidney above. Death had been due to ascending infection and pyelonephritis in the remaining kidney. In the other case the neoplasm extended from the cervix and involved the ureter in the base of the broad ligament. Atrophy of the kidney had resulted. Death was brought about by involvement of the remaining ureter which led to renal suppression and anuria.

A fatal issue in carcinoma of the cervix uteri was frequently brought about by one of the following complications: (1) renal infection: (*a*) ascending pyelonephritis, (*b*) blood-borne pyelonephritis; and (2) renal suppression. As radium therapy had now superseded radical operation in the treatment of the majority of cases of cervical carcinoma, the information obtained from cystoscopy was now of considerable importance if the extent of the disease was to be accurately delineated. The effect of radium on healthy as well as neoplastic tissues made it essential that due attention be paid to the neighbouring organ, both as a guide to technique and dosage and for purposes of prognosis. Involvement of the bladder from anterior extension of carcinoma of the cervix might be recognised in six stages of increasing gravity: (1) elevation of the bladder floor; (2) fixation of the bladder floor, judged by digital manipulation of the cervix; (3) circulatory changes; (4) transverse ridge formation: (5) œdema; and (6) malignant invasion. Of these the first three appearances were those associated with any retrovesical collection or swelling, and as such might be produced by radiation of a cervical carcinoma, the bladder not being involved by malignant disease. In such cases the appearance of the ureteral orifice was very important as the earliest guide to the diagnosis of involvement of the lower urinary tract, and in a series of patients where spread of the cervical carcinoma was taking place the first changes in the bladder were noted there. The appearances of the ureteral orifice met with, in order of gravity, were fixation, retraction, circulatory changes, irregular gaping, and ulceration and nodule formation. In a series of cases in which such changes in the ureteral orifices gave early evidence of anterior extension of the carcinoma it was found that the general health of the patients remained excellent for over eight months before mechanical interference of the excretion of urine brought about renal incompetence.

By an operation such as intrasigmoid transplantation of the ureters complete vesical exclusion could be carried out safely, and after the operation the patient had comfort and complete urinary control. After successful transplantation, the lesion in the pelvis might be attacked with renewed hope, and irradiation or radical surgery might be directed entirely to the carcinoma and its eradication. Its efficacy need no longer be tempered by allowance for the protection or preservation of components of the urinary system.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF PATHOLOGY.

At a meeting of this Section on Feb. 27th, with Dr. J. Lait, the President, in the chair, a case of

Auto-agglutination of the Blood

was reported by Dr. William Boxwell. The patient, he said, was a woman aged 65, and in the winter of 1928 she developed jaundice while in France. When she was seen by Dr. Boxwell in July, 1929, all trace of jaundice had disappeared but she was anæmic. Attempts to perform blood counts or to prepare films of her blood failed owing to almost instantaneous agglutination of the red cells. She recovered and remained fairly well till July, 1930, when she was again examined. It then proved possible to estimate the number of white cells, although only with difficulty. They were found to be 40,000 per c.mm. and 86·5 per cent. of them were mononuclear leucocytes. A relapse occurred in August and the patient became very anæmic and jaundiced. Her hæmoglobin fell to 20 per cent. She was treated with liver extract, Ventriculin, and arsenic, and slowly improved; when she was seen in December last the red cells numbered 3,000,000 and white cells 6000 per c.mm. Hæmoglobin was 60 per cent.

Dr. J. W. Bigger described his investigation of the blood condition. Blood was collected in a warm syringe and divided into two portions, one of which was placed in a dry tube, the other in sodium citrate solution. Both were kept at body temperature and by centrifuging, surrounded by a water bath, the serum and cell fractions were separately obtained without chilling. The patient's cells were found, when tested against sera of the four groups, to act as normal Group O (Moss IV.) cells. The serum agglutinated rapidly and intensely all types of human cells including Group O cells and the patient's own cells. This, however, only occurred at air temperature and not at body temperature. When agglutinated cells were warmed to 37° C. they became uniformly suspended, and when again cooled they reagglutinated.

Dr. Bigger gave an account of the phenomenon of auto-hæmagglutination and distinguished it from pseudo-agglutination and pan-agglutination. He had, he said, found only 22 cases of true auto-hæmagglutination recorded. This case constituted the twenty-third and the first to be described in Ireland.

Dr. W. D. O'Kelly said he had tested very many sera for the Wassermann reaction, but had never encountered one which gave auto-agglutination.

Dr. R. A. Q. O'Meara read papers on (1) the mechanism of the Voges-Proskauer reaction, and (2) a method of detecting acetylmethylcarbinol formation by bacteria.—Dr. H. C. Drury described a case of thrombosis of the middle cerebral artery.

Hospitals and Approved Societies.—At the annual meeting of University College Hospital recently, when Prince George was elected President, Sir Herbert Samuel, the chairman, called attention to "the immense contribution which the voluntary hospitals are making towards the working of the National Health Insurance Act." Last year over 2000 members of approved societies were treated at a cost of £22,000, towards which the societies contributed only a little more than £3000. Of 124 of these societies whose members were admitted to the hospital 44 contributed part of the cost and 80 contributed nothing. The hospital is greatly in need of accommodation for paying patients. A beginning has been made by the provision of eight private wards in the Royal Ear Hospital, but further extensions are being delayed by lack of means.

REVIEWS AND NOTICES OF BOOKS

Diseases of the Chest.

By W. J. FENTON, M.D., F.R.C.P., Consulting Physician, Charing Cross Hospital; Physician, Hospital for Consumption and Diseases of the Chest, Brompton; and L. S. T. BURRELL, M.D., F.R.C.P., Physician, Royal Free Hospital and Brompton Hospital. London: Jonathan Cape, Ltd. 1930. Pp. 384. 15*s*.

THE writers of this book have had in view the requirements of the general practitioner and senior student and have endeavoured to make it as practical as possible. It has been written mainly from the clinical standpoint. They certainly deserve credit for having had the temerity to state in a text-book that the physical signs which formerly constituted the chief means of clinical investigation have acquired an importance somewhat out of proportion to their actual value in view of modern and more precise methods of diagnosis. The physician who has access to all the methods now available for the diagnosis of chest diseases knows that an X-ray examination must form an essential part of the proper examination of every chest case; he practises bronchoscopy and thoracoscopy and has learned the proper use and value of opaque oils in chest radiology. He does not need to be told how slender may be the connexion between physical signs and pathological facts. But the student beginning his clinical work is still taught to attach undue importance to slight variations in physical signs and may waste time in cultivating arts which have little practical bearing on the diagnosis of disease. The practitioner it is true cannot expect to master the complicated technique required for certain forms of investigation nor to be able to handle instruments whose safe use must depend upon specialised skill, but there is no reason why his attention should not be directed to the limitations of older methods and to the principles involved in the application of the new. He should at any rate be in a position to know when special methods are required and how to interpret the information obtained from them. Preliminary chapters give short accounts of the anatomy of the chest, the respiratory mechanism, and physical signs. The chronic and acute diseases of the lung are described in 20 chapters, illustrated by numerous well-selected radiograms. A further chapter deals with rare and unusual conditions. The inclusion of this is a good example of the common sense and mental balance that characterise the teaching of Dr. Burrell and Dr. Fenton. Nearly a third of the book is devoted to pulmonary tuberculosis.

The authors have endeavoured to compress a vast subject into a narrow space. On the whole they have succeeded, but their work might be improved by rearrangement in some places and by more explicit instructions for the guidance of the young practitioner in others. Thus in the chapter on acute lobar pneumonia, perhaps the most important one in the book, much of the treatment is given under the heading of Diet, while the section headed Treatment is fragmentary. The recently qualified student called to a case of pneumonia and wishing to refresh his memory by consulting this text-book might depart to his case having missed the best part of the teaching Dr. Fenton and Dr. Burrell are so well qualified to give him. The sections on bronchiectasis and new growths are particularly good. The only serious omission that we have noted is that of pulmonary asbestosis from the chapter on pneumoconiosis. The value of the book to the young practitioner would be still further increased by the substitution of prescriptions set out in full for the recommendations to use individual drugs.

Primary Syphilis in the Female.

By T. ANWYL DAVIES, M.D. Lond., Director of Whitechapel London County Council Clinic, and late Medical Officer in-charge Venereal Department, St. Thomas's Hospital. London: Humphrey Milford, Oxford University Press. 1931. Pp. 111. 12*s*. 6*d*.

THIS admirable work might well have a subtitle "And other lesions of the vulva and cervix," since Dr. Davies does not confine himself wholly to primary syphilis. The book is small, and every page is packed with information of the greatest value, based on personal observation. Primary syphilitic infection in women has not before, in this country at any rate, been subjected to detailed discussion, partly no doubt because facilities for intensive study and investigation have only been available for the past 12 years or so. Therefore there has been a tendency in text-books on venereal disease or on gynæcology to say that the primary syphilitic lesion is not frequently seen in women. Though from its relative painlessness, as well as from its more concealed position, the presence of a chancre is more often ignored by women than can ever be the case with men patients, this circumstance should not serve as an excuse for its being missed during clinical examination. Dr. Anwyl Davies has seen 578 cases of primary syphilis in women, and is in a position to draw conclusions as to relative frequency in the situation of chancres. His insistence on the cervix as the commonest site of primary syphilis in women should stimulate all who make pelvic examination to more accurate diagnosis of "cervical erosions."

Among the non-syphilitic lesions dealt with we would direct attention to Dr. Davies's page on condylomata acuminata, where he stresses the fact, not yet appreciated by some obstetricians, that in pregnancy this condition is frequently non-venereal. Trichomonas vaginitis as a cause of purulent vaginal discharge, sometimes associated with intolerable itching or with warts of the vulva, is also described. The bibliography is up to date and adequate, while the photographs and coloured plates demonstrate the clinical conditions in a helpful manner.

Das Ulcusproblem im Lichte moderner Röntgenforschung.

By Dr. H. U. ALBRECHT, Superintendent of the University Medical Clinic, Frankfurt A/M. Leipzig: Georg Thieme. 1930. Pp. 79. M.10.

MANY important questions in the nosology of ulceration of the upper intestinal tract are still matters of controversy. Even broad statistics, such as those of incidence and site; the relative incidence of gastric and duodenal ulcer; the sex-incidence and the season fluctuation, vary considerably according to the standpoint from which they have been investigated. Statistics compiled by a clinician are compromised by the uncertainty of his diagnosis; a surgeon only sees ulcers that come to operation, and the pathologist only those that come to post-mortem. Radiologists, on the other hand, are in a position to note all ulcers that give rise to clinical symptoms, and even to follow them through their course. A comprehensive statistical survey based on radiological findings has been made possible through the genius of workers—notably G. Forssell, H. H. Berg, and A. Akerlund—who have developed what they term the "relief study" of the intestinal mucosa; palpating with infinite care and thoroughness a small quantity of opaque food into all the folds. This method allows the diagnosis and location of an ulcer with much more precision than has hitherto been possible, though the quite recent innovation (see THE LANCET, 1931, p. 371) which enables actual photographs to be taken within the stomach should in competent hands provide results of comparable accuracy.

The work recorded in this book is partly a statistical study based on the investigation of 1527 cases, representing all the patients who complained of gastric disorder during two years at the clinic of Frankfurt University. It shows definitely that the incidence of ulceration is very much higher than has been supposed, the percentage of this large group with visible ulceration being nearly 24. The statistics will be of great interest to all workers who have realised the inadequacy of the present data. It is particularly interesting to compare these figures with those of the latest operation results published by D. C. Balfour from last year's work at the Mayo Clinic. The reproductions of radiograms, of which there are over 100, admirably illustrate the possibilities of the method. The work would be improved by a table of contents and an index, and also by a little more subdivision, but the reader in search of statistics will easily find what he needs.

Sixty Years of Health and Physick.

By S. G. BLAXLAND STUBBS and E. W. BLIGH. London: Sampson Low, Marston and Co., Ltd. 1931. Pp. 253. 15*s*.

THE authors here do not attempt to write an inclusive or categorical history of medicine; they point out that this has been done in several directions, and done very well, and throughout their work they give cordial acknowledgment to Dr. Charles Singer, Dr. F. H. Garrison, Mr. W. H. S. Jones, Sir Clifford Allbutt, and many others, who have helped to make the long story familiar to us. In this book it has been attempted, and with real success, to give a picture of the progress of ideas from primitive magic to modern therapeutics as that picture is reflected in the course of internal medicine, and the rapid survey ends with a note on the great accomplishments which have accompanied the development of medical theories, as they maintain their force, while the legitimate aspirations which may be founded upon the conquests of the past are passed in review. Recalling the dullness of the conventional school history, with its catalogue of king-names, the authors point out that they have discarded this method as far as possible, although certain names must inevitably stand out in the record. Their aim has been rather to seize upon the prevalent ideas of each age of medicine, fostered as they have been by the leaders at one epoch, and illustrate their fate as they were handed on, to be expanded, reformed, or perhaps discarded by the leaders in succeeding epochs; but where great names occur the ideas for which they stand are demonstrated, and sometimes set down in the words of the protagonists. In this way we have displayed to us a chain of succeeding intuitions with their deductions and sequences, and can see the interdependency of the links.

The book is delightfully illustrated, the pictures being selected always as aids to the telling of the story, which story shows two main things. First, it proves that while disease is far older than man the quest for health is far younger—it is an ironical fact that the earliest type of man known, the ape-like Java man (*Pithecanthropus erectus*), suffered from exostosis of the thigh bone which is very well shown in the plate. The second message of the book is that while medicine has none the less a long record of its own, it is only in recent times that our outlook has been revolutionised for the better by the assignment of the first place in our efforts to prevention. Sir Humphry Rolleston in a brief preface says: "In tracing the evolution of 'physick' from primitive magic to modern medicine the authors have successfully brought out the importance of the preventive idea which should permeate the teaching, practice, and research of the medicine of the future."

The first ten chapters and Chapter XIX. were written by Mr. Stubbs and the remainder by Mr. Bligh, the literary labours being shared almost exactly between them. They can also share in the credit which the book will undoubtedly bring them.

Indian Journal of Medical Research.

IN the current issue (Vol. XVIII., No. 3, January) J. A. Sinton continues his studies on malaria with special reference to treatment. In Part 14 he concludes that with a more prolonged course of treatment the permanent cure rate can be increased, but that the increase is not directly proportional to the duration of treatment or to the total amount of quinine given. The influence of the strain and virulence of the parasite in affecting cure is also considered. He concludes that seasonal effects are probably a factor influencing the mechanism of cure and relapse.—N. D. Kehar deals with aspects of the behaviour of cinchona alkaloids towards living cells, their penetration into colloidal gels receiving special consideration, as well as the effects of plasmoquine on the penetration of cinchona alkaloids.—H. N. Mukherjee and P. C. Gupta record a series of observations on the basal metabolism of Bengali Indians, and find that for young men the average is minus 13·3 per cent. (Aub and Dubois standards), a result possibly due to climatic and nutritional causes. Pulse pressure and vital capacity are also low.—K. K. Das contributes a note on the blood changes in filariasis, recording no marked fall in hæmoglobin percentage or in the red blood-cells from the normal standard.—Several papers deal with Indian sandflies. J. A. Sinton describes the diagnostic characters and differential diagnosis of *Phlebotomus eleanoræ* and *P. bailyi*, while H. E. Shortt adds a note on the feeding habits of *P. minutus*, stating that it never feeds on man in Assam. These results are at variance with a recent paper by R. B. Lloyd and L. E. Napier on the Blood-Meal of Sandflies, investigated by means of Precipitin Antisera.—A new species of culicoides is described by S. Mukerji.—Several papers by D. C. Wilson deal with osteomalacia and late rickets, while R. McCarrison records further observations on stone.—S. Sunder Rao figures a new species of human microfilaria to which he gives the name of *M. actoni*. The embryos were of very small size, devoid of a sheath and allied to *Acanthocheilonema perstans*. Unfortunately the description was made on a single blood smear, the case being later lost sight of.—S. M. K. Mallick and M. L. Ahuja consider the incidence of brucella agglutinins in an average unselected Indian population, healthy and febrile cases both being examined. Positive reactions were found distributed between the two groups. The volume contains divers other papers amongst which may be mentioned one dealing with the rat-flea survey of the Madras Presidency, and another with the cocaine habit in India.

THE LANCET.

LONDON: SATURDAY, APRIL 4, 1931.

CLINICAL USE OF OVARIAN AND PITUITARY HORMONES.

It is now some eight years since **Allen** and **Doisy** published their original communication on the preparation of the ovarian follicular hormone, œstrin. Many other investigators were soon at work along similar lines, and it was not long before an active water-soluble extract was obtained. Thus it may seem a little surprising that the substance has not yet attained a definite place in clinical medicine. During the first year or two after its appearance on the market enthusiastic reports of its action were indeed forthcoming, but later such accounts were not so frequent, and nowadays but few successful cases are recorded. A recent paper by A. S. **Parkes**[1] shows clearly why treatment of this kind is not at present likely to be satisfactory. Experimenting with baboons whose cyclical changes had been stopped by oöphorectomy, he was able by injection of œstrin to produce the vulval and peri-anal swelling which is characteristic of the follicular phase in these animals. But about 60,000–80,000 mouse units were required for this effect, and calculating on a basis of weight this would correspond to 400,000 units for an adult woman weighing 50 kg. Such large amounts have never been available, and it is therefore not to be wondered at that in clinical practice little has been achieved, except perhaps where ovarian deficiency is very slight. The present position is illustrated by three papers[2] lately published in this country. In the following table compiled from them the word positive indicates apparent response to the treatment and the dose is the total amount injected.

Number of Cases and Type.

—	Primary amenorrhœa.	Positive.	Secondary amenorrhœa.	Positive.	Dose range.
Shaw	5	0	8	6	—
Dodds and Robertson.	32	10	30	18	600–600 rat units.
Gardiner-Hill and Forest Smith ..	7	1	37	20	30–500 rat units.

The cases chosen were for the most part those in which it appeared that the fault consisted in ovarian deficiency only. Where this was primary the results were not strikingly successful; where it was secondary they were more encouraging. The range of dosage available was, of course, small in comparison with the very large figure mentioned above.

The figure of 400,000 mouse units is the dose for subcutaneous injection, and if the œstrin were to be given by mouth an increase of at least ten times would be needed, making 4,000,000 in all. The exact relation between subcutaneous and oral dosage of œstrin is not, however, decided. E. **Laqueur** and co-workers in 1927 found that 100 times the subcutaneous dose was necessary to produce œstrus when it was given by mouth, but some of the German workers find that its oral efficacy depends on the activity of the preparation; for example, with one containing 8 million units to the gramme, 50 units are required to produce œstrus, whereas with one containing 200,000 units to the gramme only 6 units are required. M. M. **Maino**[3] lays stress on the importance of the vehicle used in administering the hormone. With an alcoholic solution, he says, the oral and subcutaneous doses were identical, and this is a result whose comfirmation will be awaited with interest. It is clear, however, that whether the oral dose is or is not equal to the subcutaneous dose, the quantity needed for human beings is so great that there is no immediate prospect of a sufficient supply being available and cheap enough to make œstrin medication generally practicable.

As regards the anterior pituitary or placental hormones there is only one field in which incontrovertible results have been obtained in clinical practice—namely, the Aschheim-Zondek test for pregnancy. Owing to the definiteness of the results the interest centred at first on the ovaries, and it is only latterly that the influence of these hormones on the male genitals has been studied. Most workers agree that the most striking effect of anterior pituitary treatment in the immature male is a stimulation of the growth of the seminal vesicles and prostate; the testes appear to be relatively little affected, at any rate as far as gross weight is concerned. In the female the anterior pituitary hormones act on the uterus and vagina through the ovary, and in an analogous way they act in the male through the testis, so that after castration they have no effect on the vesicles and prostate. Their action on the testis does not seem, however, to have been fully worked out. Some workers assert that these actually decrease in weight as a result of anterior pituitary treatment. Histologically the interstitial tissue is found to have undergone hypertrophy; in some parts the spermatic elements have suffered damage, in others no evidence of damage is seen and there may even be signs of partial stimulation, consisting in an increased production of spermatocytes, without an increased or premature production of spermatozoa.

Further information on the action of hormones obtained from the urine of pregnancy is contained in a series of papers recently appearing in the *Münchener medizinische Wochenschrift.* The third of these (Jan. 2nd, p. 19) deals with the influence of the follicle-ripening fraction (prolan A) upon the genitals of immature rats. In the male no stimulation of interstitial tissue was observed, and corresponding to this there was no growth of seminal vesicles or prostate. Using the unsplit prolan A-prolan B mixture a much greater degree of damage to the spermatic elements was noted, but the interstitial tissue was markedly hypertrophied; in this case the accessory organs were enlarged. It is interesting thus to note that the follicle-ripening hormone is, in the male, capable of bringing about a certain degree of maturation of spermatozoa, but appears to be unable to complete the process. This result was indeed reported in 1927 by Smith and Engle[4] who found that while the interstitial tissue is hypertrophied, spermatogenesis is not accelerated and there is sometimes actual damage to the spermatic elements. In the adult rat, however, B. P. Wiesner[5] was able to obtain renewal of spermatogenesis after this had almost ceased. There is therefore some other factor (or factors) concerned in the production of ripe spermatozoa which does not seem to arise in the anterior pituitary, or to be present in the urine of pregnancy. While it may appear that there is some foundation for a rejuvenation technique in the male by the use of anterior pituitary products, our knowledge is so narrow that at present their clinical use must be regarded as little more than guess-work.

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[1] Jour. Anat., 1931, lxv., 275.

[2] Shaw, W.: Quart. Jour. Pharm. and Pharmacol., 1929, ii., 373; Dodds, E. C., and Robertson, J. D.: The Lancet, 1930, i., 1390; Gardiner-Hill, H., and Smith, J. Forest: Ibid., Feb. 28th, 1931, p. 464.

[3] Arch. d. Istit. Biochem. Ital., Nov., 1930, p. 495

A TUBERCULISED COMMUNITY.

Visitors to health resorts in the Alps where tuberculous patients foregather have often felt qualms about the risk of sojourning in such a community. Opinions have varied from the vague statement that Davos is a hotbed of infection to the categoric assurance that no death from tuberculosis has ever occurred in any native of the valley. The local medical fraternity has generally been content with the placebo that whatever may be the risk of infection it is more than balanced by the immunity provided by the environment. Exact figures have been hard to come by, but we now have a remarkable study[6] of the tuberculisation of a well-known Alpine station by a medical man with a peculiarly intimate knowledge of the facts; for as pastor in the valley he was acquainted with the domestic life of the inhabitants, and after taking his medical degree he practised as school doctor. As Arosa is his field of investigation it may be wise at once to anticipate his conclusions by stating that, although evidence of tuberculisation is unquestionable, there has been nevertheless a death-rate from tuberculosis among the inhabitants scarcely one-half of that in other parts of Switzerland. The development of Arosa as a health resort makes any statistical analysis difficult. In 1850 it was an isolated village with a diminishing population, then numbering at most 75. In 1884 came the first winter visitor. In 1888, when there were 88 inhabitants, appeared the first publication of its value as a health resort. In 1893 occurred the first death from tuberculosis in a native. In 1900 there were 1071 inhabitants, and the first disinfection order was issued. In 1910 the number of winter visitors first exceeded 1000, in 1929 they numbered 3200, of whom one-half were there for winter sport. The inhabitants had then increased to 2931.

Dr. Gahwyler set himself to determine the tuberculisation by examining all the school-children by Moro's innunction test. This he was unable to do until the autumn of 1929, as up till then one of his colleagues had expressed a doubt of the harmlessness of the test. As a matter of fact in the case of four children of 7–8 years there was a complaint of fever and loss of appetite, possibly associated with the test. Only six parents of the 233 children of all ages in the school refused to have their children tested; six children had been at school less than a year and were not included. Of the remaining 221, 139 reacted, giving a percentage of 62·9 reactors; 55·5 per cent. reacted already in their seventh year, compared with 20 per cent. for Zurich school-children of the same age. No such high figures are on record elsewhere; those of Kiel approach most nearly. Analysing the results in three groups Dr. Gahwyler found more positive results among those born in Arosa than immigrants. Two-thirds of the positives came from relatively well-to-do families. Tuberculisation was twice as intense in the centre of the village as in the periphery. Children of the same family were in general all reactors, but there was an instructive case of five older children born while their parents were keeping a small pension who were positive, while a sixth child born after the parents were managing an hotel in which they had separate quarters was negative at 5 years of age. In another family all the older children were infected by an aunt; the youngest child born after her departure remained Moro-negative. In all these children clinical examination showed nothing unusual. About a quarter had enlarged glands, but a number of them were non-reactors. X ray examination revealed no single case which Dr. Gahwyler could interpret as early tuberculous infiltration; all the shadows indicated infection which had taken place in the pre-school years. It is worthy of note that of all these children only two showed any signs of rickets and these had not spent their early years in Arosa.

Turning to the actual illness produced by this frequent tuberculisation of the local children, Dr. Gahwyler found most surprisingly that it accounted for little or no school absence. On the average at most one of the 200 school-children was absent during the year from any tuberculous disease; at the present time it is a 13-year old girl with coxitis. Thus the morbidity in school age is practically nil. Nor could he find any school leaver who sickened with active tuberculosis in Arosa during the dangerous years from 15 to 25;

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[4] Smith, P. E., and Engle, E. T.: Amer. Jour. Anat., 1927, xl., 19; Engle, E. T.: Anat. Rec., 1927, xliii., 187.

[5] Edin. Med. Jour., 1929, xxxvii., 18.

[6] Gahwyler, M.: Tuberkulosedurchseuchung, Morbidität und Mortilität in Arosa, 1890–1929, Beitr. z. Klin. der Tub., 1930, lxxv., 269.

a single 18-year old girl was reported to have severe phthisis after going to live in Milan. On the other hand in the pre-school age the morbidity was definite. Between 1916 to 1925 he saw 7 children under 5 years of age with tuberculous pneumonia, 12 with persistent bronchial gland inflammation, 2 with primary lung infiltration, and 1 each with otitis, keratitis, and cervical lymphoma. All these children are to-day quite well. It strikes Dr. GAHWYLER, as it will strike others, as remarkable that in spite of daily contact in the restricted space of a small boarding-house, often at the same table with cases of open tuberculosis, no single school-child became seriously ill. Good climate in itself can hardly account for this immunity. Possibly, he suggests, the high hæmoglobin value may produce an individual immunity so that daily superinfection acts like a course of therapeutic tuberculin. The immunity may be further due to the intensive insolation, especially with ultra-violet rays, for in Arosa the school-children do not live the usual indoor winter life of the lowlands. The bodily hardening which certainly does not shield from infection seems to raise the level of the immunising forces after infection has occurred.

Finally Dr. GAHWYLER comes to the mortality from tuberculosis among the children of those who were born or have settled permanently in Arosa. Before the valley became a health resort no native died of tubercle, but then of course there were few of them to die. In 1893 occurred the first death, being that of a 14-year old peasant girl who did a patient's room in a neighbouring house. All the other 19 deaths in the 40 years 1890–1929 occurred in the families of those who settled in Arosa on account of tuberculous disease, although a certain number of deaths may also have occurred among those who married into the valley or worked there temporarily. For instance, three fatal cases occurred at a laundry. Of all these cases no single one died of chronic phthisis. Death was always the result of the primary infection or of the secondary stage of generalisation. Actually the deaths were certified as meningitis 11,; tuberculous pneumonia, 5; renal tuberculosis, 2; pulmonary tuberculosis, 2. Five of the deaths were under one year, five from 2–5, five from 5–15, and five from 15–30. Stated as a proportion of the total number of settlers the result is 7·1 deaths from tuberculosis per 10,000 living, as compared with a figure of 13·8 for Switzerland as a whole. This, as Dr. GAHWYLER remarks, is the more striking as Arosa has no tuberculosis dispensary; doubtless every doctor makes it his duty to call attention to the dangers of infection, and the official school examination must have a similar educational effect. Of the nature of the infection when it occurs, Dr. GAHWYLER thinks we can no longer be sure. The seven intra-familial fatal cases he attributes to a superinfection occurring in the anergic phase of the primary stage. In other infections within and without the house the child has generally had time to develop its own immunity and allergy. Constitution plays the same rôle as in the plains, and Dr. GAHWYLER emphasises again the fact that even the smallest child is exposed to fresh cold air for hours a day throughout the winter and thus lays up a store of health for the rest of life.

THE OSTEOPATHY BILL.

THE full text of the Registration and Regulation of Osteopathy Bill is now available; it will doubtless receive the careful attention of the medical profession. The "practice of osteopathy" is defined to "include the performance of any such operation and the giving of any such treatment, advice, or attendance as is commonly given by osteopaths and any other necessary measures required for the efficient performance of osteopathy." To decide what treatment is "commonly given by osteopaths" may be a matter of considerable controversy. If the proposed definition were to become law, it would seem that, provided that persons calling themselves osteopaths make a sufficiently vigorous invasion of the province of the surgeon and the medical practitioner, there is no form of surgical operation or medical treatment which will not be part of the practice of osteopathy. Clause 7 gives the registered osteopath most of the scanty privileges at present reserved for registered medical practitioners. Though the Bill apparently concedes no direct authorisation to prescribe and use drugs which come under the Dangerous Drugs Acts, it proposes to empower the registered osteopath to sue for his fees in a court of law, notwithstanding the existing restrictions in Section 32 of the Medical Act. The Bill further proposes to allow him "to sign certificates of birth and certify the cause of death and sign certificates of death, and, provided he is licensed as hereinafter provided, to administer anæsthetics and perform minor operations." In spite of the qualification that the operations are to be minor operations, and in spite of an imposing list of subjects and minimum hours of study therein scheduled to the Bill. Clause 7 seems to contemplate a remarkable range of practice for the osteopath, and a remarkable confidence in his powers of diagnosis. Not only is his position in the matters already mentioned to be thus equalised with that of the registered medical practitioner; in one respect it is to be made far superior. Under Clause 8 the registered osteopath is given a monopoly of practice in terms resembling those of Section 1 of the Dentists Act of 1921. At present, as registered medical practitioners know to their cost, persons who have duly qualified in the practice of medicine and surgery have no legal protection whatever against the invasion of such practice by the unqualified. If the new Bill were to pass into law, it would seem possible that duly qualified surgeons, while themselves having no monopoly as against the osteopathic invader, might actually be restricted in their use of certain forms of manipulative treatment because of the monopoly to be conferred upon osteopaths. The remaining clauses of the Bill have affinities with the legislation affecting medical practitioners, dentists, and veterinary surgeons. There is to be

Where the secreting power of the kidney is damaged, the faintness or absence of the shadow produced by the excretory method gives an index of the degree of injury to the concentrating power of the kidney. There are other cases in which instrumental urography may fail, either wholly or in part, and in which the excretory method furnishes good visualisation. In tuberculosis, for example, the presence of cystitis often precludes the use of the instrumental method, while excretion urography can be used with safety. Physiological disturbances such as atony of the ureter following obstruction or infection, and anatomical variations such as ureteric kinking or fixation are shown by excretion with a certainty which the instrumental method cannot achieve. It is possible, moreover, to determine by excretion urography whether a much distended ureter is capable of emptying itself actively or not. Such an opportunity for the estimation of physiological function may have a bearing on the choice between conservative and extensive operations. In some cases—for example, where the ureter is occluded by stone or new growth—the instrumental approach to the kidney cannot be employed but excretion urography often gives a clear picture. Prof. Lichtenberg bases his conclusions on observation of more than 2000 cases, and his radiograms show the high degree of definition to be obtained by the use of the new contrast substances.

ANASTOMOSIS OF NERVES.

It is just over a hundred years since Flourens divided the two main nerves of the brachial plexus in the cock and united the central end of one with the peripheral end of the other, showing that the communication of impulses was perfectly re-established and crossed. Sir Charles Ballance has recently published[1] an account of some experiments in which the central end of the cervical sympathetic nerve was anastomosed to the peripheral end of the facial nerve or hypoglossal nerve. His work was therefore the reverse of Langley's. The sympathetic-facial anastomosis was done on six cats, two monkeys, and two dogs. Six months later the muscles of the face had recovered voluntary movement and responded to faradic stimulation, but when the sympathetic was exposed in the lower part of the neck the muscles of the face did not contract. When the anastomosis or the sympathetic proximal to it was stimulated, they did contract. It seemed possible that in some instances nerve-fibres had reunited the divided ends of the facial nerve. This certainly did not occur in all the experiments; the predisposing factor was shortness of the trunk of the facial nerve. The failure of the faradic current to cause contraction when applied to the lower part of the sympathetic in the neck seemed to be due to the scar tissue which inevitably forms under the sterno-mastoid after the operation. Through this mass of scar tissue the impulse fails to pass, though a normal impulse originating in the central nervous system may succeed in getting through. In a typical experiment on the cat the first results are enophthalmos, small pupil, dribbling of saliva, and a flaccid paralysed face. After three months the face is symmetrical and the neuro-muscular mechanism is restored sufficiently to give reflex response to stroking the bristles. After four months there is no deformity at rest, but some inequality is visible when the animal eats. All the muscles respond well to faradic stimulation. In seven months recovery appears to be complete. When the sympathetic was joined to the hypoglossal in a cat and the animal examined three months after the operation, the operated half of the tongue was thinner and narrower than the other half and required a stronger faradic stimulation for response. In six months' time the two halves were equal and moved together; when the sympathetic was stimulated in the lower part of the neck, on the side of the anastomosis, a ripple of contraction passed along the tongue on that side. The usual signs of division of the cervical sympathetic persisted. There was much less scar tissue in this operation than in the other, and no reunion took place in the hypoglossal nerve. In another experiment the cervical sympathetic was joined to the descendens hypoglossi when the sterno-thyroid and sterno-hyoid recovered.

These experiments seem to show definitely that the cervical sympathetic nerve is able to carry impulses to nerve-endings in striated muscle. The essential element in the neuro-muscular mechanism is not a particular group of fibres, but the central cells and the nerve-endings, and the route by which the impulses travel from one to the other is immaterial. Sir Charles Ballance thinks that on the whole his work supports the view that the anatomical and functional perfection of striated muscle depends on a dual innervation.

CHOLESTEROL AS PRO-VITAMIN A.

CAROTENE as the parent substance of vitamin A has received considerable attention, and as we pointed out last week the authenticity of the relationship has become increasingly probable. The claim by H. Seel and F. Dannmeyer that cholesterol can be the direct precursor of the vitamin nevertheless deserves consideration. The suggestion is not a new one. The possibility was examined several years ago by O. Rosenheim,[1] who noticed that the substance or mixture of substances (oxycholesterol of Lifschütz) which is produced when cholesterol is oxidised gives the blue colour with arsenic trichloride reagent, which is characteristic of vitamin A. For various reasons Rosenheim abandoned the idea that oxycholesterol is, or contains, vitamin A. The blue pigment did not appear to be truly identical with that yielded by cod-liver oil; and when oxycholesterol was dissolved in natural animal or vegetable fats, the production of the blue colour reaction was totally inhibited, a peculiarity which appeared to establish a different identity for the two chromogenic substances. Some biological experiments were made with Rosenheim's material; the results were not entirely conclusive, but were deemed to be against the view that it possessed the properties of vitamin A. Other workers have obtained a similar negative result; the only positive finding indeed is that of Seel, a full account of whose work with Dannmeyer, including a description of the animal experiments, is set out in two papers in Schmiedeberg's *Archiv für Experimentelle Pathologie und Pharmakologie*.[2] In the earlier of these two papers a number of products of cholesterol and of sitosterol, both before and after their irradiation with ultra-violet light, were examined on rats for their power to prevent rickets (vitamin D) and xerophthalmia (vitamin A). These substances included cholesterol, cholesterol oxide, oxycholesterol, sitosterol, oxysitosterol, and a number of others. Of these only the oxycholesterol, both before and after irradiation, prevented xerophthalmia, and only the cholesterol and oxycholesterol after irradiation prevented rickets. It is to be noted that the capacity to prevent or cure xerophthalmia is taken as the criterion of activity in vitamin A; very little evidence is adduced as to the presence of the growth-promoting function, a point which may be significant. In the first series of experiments, the materials were in ethereal solution, which was dropped upon the diet of the rats, in measured amount, and the ether allowed to evaporate. In the second paper, further experiments with oxycholesterol are described and also some comparative ones with a concentrate of the unsaponifiable fraction of shark (piked dog-fish) liver oil. The shark liver oil concentrate was potent in doses as small as 0·00001 mg., while the oxycholesterol was not active in a dose below 0·01 mg., suggesting that the latter is a mixture of substances, of which the active part forms only a small fraction. A specimen of oxycholesterol, which was sent by Lifschütz, had an even lower biological value and only gave the antimony trichloride reaction very weakly.

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[1] Anastomosis of Nerves, Arch. Neurol. and Psychiat., 1931, xxv., 1.

[1] Biochem. Jour., 1927, xxi., 386.

[2] Seel, H.: Arch. f. Exp. Path. u. Pharm., 1928, cxxxiii., 129; 1931, clix., 93.

In this series of experiments the oxycholesterol was dissolved in olive oil for administration to the animals; in this solvent, in direct contrast with Rosenheim's results, the blue colour reaction was produced and was not fugitive. Dissolved in cod-liver oil oxycholesterol gave a blue colour reaction, which was fugitive like that of the vitamin A native in the cod-liver oil. Seel attributes the impermanence of the blue colour, when produced in cod-liver oil, to some constituent of that oil, for he found that the more he purified vitamin A from other liver oil constituents the more permanent the colour became. The permanence or impermanence of the blue colour produced by the antimony trichloride reaction he regards therefore as not characteristic of the chromogenic substance but as depending rather on the solvent medium. The spectroscopic examination of oxycholesterol was said to show the absorption band at 327 $\mu\mu$ in the ultra-violet, which is regarded as characteristic of vitamin A; but the absorption spectrum in the visible part of the spectrum of the blue product of the antimony trichloride reaction is not described, so that the presence or absence of the characteristic absorption band at 610 $\mu\mu$ is not established. Seel believes with Takahashi that the vitamin A formed on oxidising cholesterol is of a sterol nature, and that it is a very labile partial oxidation product of cholesterol. It would appear not impossible for vitamin A to be derivable both from a sterol and from carotene, but until this very interesting contribution has been fully confirmed further discussion of its implications can only be conjecture.

ACCOUNTS OF AVERTIN FATALITIES.

It is notoriously difficult to arrive at a true estimate of the death-rate for any one given anæsthetic. The factors which play a part in the fatality are usually many, and their relative importance is often hard to determine. Moreover, adventitious circumstances influence individual judgment so differently that even the death itself is variously interpreted; one man will call it an "anæsthetic death" where another would refuse to do so. Consequently we can place little value, generally speaking, on statistical inquiries into so-called anæsthetic deaths. The justification for this mental reservation we do not find shaken by Oscar Schuberth's recent investigation of the literature of deaths caused by avertin narcosis.[1] He has collected accounts, some of them meagre to the point of uselessness, of 72 so-called avertin deaths. After examining the details he comes to the conclusion that "most cases mentioned as avertin deaths will thus, on critical examination, be found not to admit of such a classification. If the great number of avertin narcoses performed is taken into consideration the published cases of death are not more numerous than would justify a continued use of this narcotic." Schuberth does not make any attempt to estimate the number of avertin administrations, of which the 72 cases might give a proportional death-rate. He decides that of these 72, 11 were, with certainty, real avertin deaths, and 3 others probably so. In the others avertin is not regarded as the responsible factor.

DR. OLIVER GOLDSMITH.

Oliver Goldsmith, like Keats and Smollett, is known as a qualified doctor, but of the famous trio Smollett was the only one who ever practised his profession, and, it seems, the only one about whose actual qualifications there is no doubt. Goldsmith has been reported to have failed to obtain a licence at Surgeons Hall, but there is some evidence now that he was M.D. Oxford ad eundem gradum. This fact has escaped the University records, but Sir William Osler discovered in a newspaper of the particular year, 1769, a note on the granting of the degree. An ad eundem degree is only conferred on those who already hold the same degree in a comparable university, and the note went on to state that Goldsmith was the recipient of a medical degree from Trinity College, Dublin. This fact also goes without substantiation from the University, but it appears from other evidence that the degree was granted in absentiâ, possibly for medical work done on the continent. So it seems that Goldsmith may have been a qualified doctor, but his short attempts to exercise his profession were unsuccessful.

A sketch of his life reaches us in the form of a communication made by Dr. J. N. Elliott Brown, of Toronto, to a local scientific society, in which the known facts are resumed and others are set out which will be novel to most readers. These make a vivid and attractive picture of a brilliant wayward man. Born of a gentle and absolutely improvident family, Goldsmith received a desultory education at Dublin University, learned French from some Catholic priests whose acquaintance he made casually, and finally presented himself before a bishop to be examined for Holy Orders. He failed to satisfy the prelate of his suitability for the office of clergyman, and decided to enter the profession of law, having found here a financial backer in the person of a good-natured uncle Contarine. This again proved a false start, at which point he became a medical student in Edinburgh. Dr. Brown supplies interesting notes on the careers and characters of the Edinburgh savants, and tells in detail the story of Goldsmith's celebrated European tramp which lasted a year, and which, according to the traveller, included Leyden, Paris, Berne, Geneva, Milan, Florence, Venice, and Padua. "Goldsmith left Leyden on foot with a guinea," says Dr. Brown, "which he had borrowed, a shirt and a flute. His final objective was Padua, where the great Morgagni reigned supreme in the Italian medical world. It took Goldsmith ten months to reach his goal. Before starting he noticed some rare tulip bulbs in a shop, and recalling his good uncle Contarine's love of flowers, bought a supply of the bulbs and forwarded them to him." How many of the galaxy of eighteenth century physicians, physicists, and philosophers, who might have been met in such a wander-jahr, Goldsmith personally encountered is doubtful—certainly not all those whom he professed to have spoken with—but he seems to have included medical among his other experiences, even if his statement be not accepted that he received a medical degree at Padua.

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[1] Acta Chir. Scand., 1931, lxviii., 55.

Dr. Brown describes a man, brilliant with tongue and pen, charming, humane, and learned, who possessed no characteristics that would make it likely that he would succeed in the practice of medicine and many that would have antagonised his professional chances.

STREPTOCOCCAL INFECTION THROUGH MILK.

THE cow is in some ways imperfectly fitted for her high calling. Her mammary glands are situated so far back that constant care is needed to keep them clean; she shares with mankind a number of important constitutional diseases such as tubercle; and occasionally she acts as intermediary in the spread of human infections from one person to many. This last possibility—of the cow acting as a local vehicle for infection—is not nearly so well recognised as her other defects, but is well worth consideration, especially as it concerns the streptococci. In the 'eighties much interest was aroused by Power's suggestion, fortified by Klein's investigations, that the human outbreak of scarlet fever at Hendon was due to scarlet fever in the cow. This conception was repudiated by the veterinary profession and fell into disrepute and almost derision. On the other hand, between 1890 and 1910 a number of outbreaks of human sore-throat were reported which were undoubtedly spread by milk and which were often associated with a cow suffering from mastitis, whose removal from the herd stopped the outbreak. The puzzle was that bovine mastitis was very common while these outbreaks were distinctly rare. Investigating the problem for the Local Government Board in 1906–09, W. G. Savage satisfied himself that the ordinary type of bovine mastitis was harmless to man but that the bovine type of streptococcus was not the only streptococcus responsible. From these experiments, aided by the known fact that rarely implantations of diphtheria bacilli occur on teats of cows, he advanced, in 1911, the view that while the ordinary bovine mastitis and teat lesions were harmless to man, occasionally there is a local infection with organisms of human origin. In such cases these human strains of streptococci may be decidedly prejudicial to man. Applying the same hypothesis to scarlet fever, and after a study of the original records, he considered the Hendon outbreak as not due to a constitutional disease, bovine scarlet fever, but due to a local infection of the cow with the organism of scarlet fever.

Subsequent extensive work, mainly in America, has shown that this hypothesis is almost certainly true for angina outbreaks and is probably applicable to some milk-borne epidemics of scarlet fever. Bacteriologists in America and in England have devised valuable tests to distinguish between streptococci of bovine type and those of human ancestry found in a bovine habitat. While these identification tests make it possible to ascribe with some precision the origin of a milk-borne outbreak due to streptococci, they have brought to light some points of difficulty. For example, American workers—and now Minett and Stableforth in this country—have been able to identify the human pathogenic types of streptococci in the udders of certain cows without this fact being associated with human disease. At a discussion reported on p. 755 of this issue various possible explanations were suggested but none is as yet supported by convincing evidence. We also do not know the conditions under which these human types of streptococci infect the udder, but there is some evidence that teat or udder injury is an important factor.

On the epidemiological side there are also unsolved problems. After about 1910 sore-throat outbreaks spread by milk stopped, or were not recorded, in Great Britain until the Hove outbreak in 1929. On the other hand, they were not recorded in U.S.A. until 1911, and have continued to be reported there up to the present time. We have no reliable data capable of explaining this curious distribution. Whatever may be the explanation it is interesting that the cow can under certain circumstances take to its bosom human streptococci possessed of pathogenic properties, and allow them to multiply and infect the milk in vast numbers. In Hove and Brighton there were over a thousand cases and more than sixty deaths.

GLASGOW OBSTETRIC CONGRESS.

THE eighth British Congress of Obstetrics and Gynæcology will be held by invitation of the Glasgow Obstetrical and Gynæcological Society in the Lister Memorial Lecture Hall of the Royal Infirmary, Glasgow, from Wednesday, April 22nd, to Friday, 24th. The Congress is organised by three English, two Scottish, and two Irish societies; on this occasion Dr. David Shannon will preside. The first day will be used to discuss the clinical and pathological features of ovarian tumours (excluding endometriomata), to be introduced by Prof. Blair Bell and Prof. Beckwith Whitehouse from the clinical side and Mr. T. G. Stevens from the pathological side. On Thursday morning Prof. S. A. Gammeltoft, of Copenhagen, will open the session with a paper on the teaching of obstetrics and gynæcology in Denmark, and Prof. H. Guggisberg, of Berne, will open the afternoon session (at the Anatomical Institute) by a paper on the conditions of life and reproduction; later Prof. T. H. Bryce will demonstrate the famous Hunterian collection in this institute. Friday afternoon will be devoted to visiting various hospitals in the city. There will be numerous individual contributions to the various sessions, and Dr. Alice J. Marshall is in charge of a special museum of pathological specimens. On the social side, members of the Congress will be received by the President and Mrs. Shannon at the College Club on Wednesday evening, and members will dine together at the Central Hotel on Thursday. On Saturday will be unveiled in the cemetery of St. Kentigern at Lanark the renovated tomb of Dr. William Smellie. The secretaries of the Congress are Prof. James Hendry, 7, Clairmont-gardens, Glasgow, C. 3, and Dr. John Hewitt, 16, Whitehill-street, Glasgow, E. 1.

AT a meeting of the Royal College of Physicians of London on March 30th, Lord Dawson of Penn was elected President in succession to Sir John Rose Bradford.

FISHING RIGHTS FOR HOSPITALS.—Mr. G. M. Leman, a retired schoolmaster residing at Kirkbythore, has presented to Cumberland Infirmary and Penrith Cottage Hospital, in equal shares, 28 acres of land on the River Eden together, with the appurtenant fishing rights. The land is situated on the Bolton side just opposite Kirkbythore. Mr. Leman has at the same time given £50 to Penrith Hospital.

SPECIAL ARTICLES

THE PROBLEM OF THE MILK-SUPPLY.

REVISION OF DESIGNATIONS.

By VISCOUNT ASTOR.

I RECENTLY initiated a debate in the House of Lords on the milk-supply during the course of which Lord Moynihan pointed to the injury caused by tuberculous and contaminated milk. Every surgeon could probably confirm this and give similar illustrations. But the misunderstanding created by his speech in agricultural circles shows how little that industry is ready to acknowledge the risks, and *therefore prepared to put matters right*. On the other hand, the difficulties of farmers and of legislators and administrators may not be realised in medical circles. As we need an instructed public opinion before we can get progress I propose to outline certain aspects of the problem which have not been fully dealt with in the articles and letters recently published in THE LANCET, and to put forward suggestions for improving matters.

WOEFUL UNDER-CONSUMPTION.

Let me begin by summarising certain facts which are beyond dispute. In England there is a woeful under-consumption of liquid milk. Canadians drink twice as much per head, Americans thrice, Danes and Swedes *six times* as much as we do. There are whole streets in some of our industrial cities where not a drop of milk is purchased. Much of the surgical tuberculosis is of bovine origin. Much infantile diarrhœa in hot weather is attributable to stale, decomposing dirty milk. The dairy industry suffers considerable financial losses through premature souring. All of this is so in spite of a genuine improvement.

The imports of dairy products are increasing so that they are worth (1928) £72,433,198, and represent the output of some 130,000 cows, whilst the imports of dried and condensed milk alone represent the output of about 50,000 cows and are worth £5,500,000 to overseas producers. Yet farmers complain of a glutted milk market. *There obviously cannot be an* over-production when there is such an under-consumption of milk.

And all the time we know that milk is an essential food for children, and we ought to realise that at present prices it is a cheap food. One quart of milk costs 7*d.*, whilst the following equivalents in food value to a quart of milk cost more—i.e., one pound of lean meat 1*s.* 2*d.*, 10 eggs 1*s.* 8*d.*, 2 lb. of cod fish 2*s.*, 1 lb. of chicken 2*s.* 6*d.* The experiments of Dr. H. C. Corry Mann and Dr. J. B. Orr prove that if school-children are given a daily ration of milk in addition to their usual meals, their height, weight, health, spirits, and ability to use their brains increase. Such a ration would mean a new market for milk producers worth £4,000,000. Even if provided free by the taxpayers it would cost £2,000,000 less than last year's sugar-beet subsidy and be of far greater benefit both to agriculture and to the nation.

Dairying and livestock should be made the corner-stones of British agriculture. We have the right climate, and are pre-eminent in livestock. Cows are found all over the country and are not restricted to particular districts like wheat, sugar-beet, or hops. They are associated with all types of farming—small and large, grass and arable. Our dairy produce as sold off farms (1928–29) is estimated at £56,000,000, our livestock at £78,600,000. This is far more valuable than our wheat crop (£12,000,000), to stimulate which certain political and agricultural leaders contemplate asking the overburdened taxpayer for a subsidy of £5,000,000 to £10,000,000.

A CHAOTIC SITUATION.

The milk situation is chaotic, muddled, unsatisfactory both for agriculture and for the welfare of the nation, particularly its children.

National interests require that we should at least double our consumption of home produced liquid milk and reduce our imports. But national interest equally demands that our supply should be far safer *than it is to-day*.

No "government" (used in its widest sense) could back a "*Drink more milk*" publicity campaign, no Government could urge education authorities to get school-children drinking milk unless at the same time a guarantee could be given that the milk was reasonably safe. To-day such a general assurance could not be given.

In the past—and to-day still—farmers have refused to admit the facts of the situation. Farmers are too apt to take up a short-sighted attitude. "Leave us alone, don't stir up discussion about milk," is often their cry. If the dairy industry were flourishing, if we were drinking as much milk as other nations, this attitude might be justifiable. But it is hopelessly unbusinesslike to-day when milk imports are rising and home sales are low. In 1914 in the House of Commons I made the then novel suggestion that milk should be graded and labelled according to its hygienic quality. The agricultural M.P.'s as well as Ministers representing the Local Government Board and Board of Agriculture fell on me as a heretic and Philistine, insisting that there must be only one quality and that the best. The result, of course, was that for years there was only one quality, and that the worst. Gradually we have become more enlightened and for some years now grading according to cleanliness has been recognised. The bacterial content and the tuberculin test are at last admitted to be as important as butter-fat content.

THREEFOLD REMEDY.

What, then, are the obstacles? What is wrong? and above all, what is required of the milk trade, of the legislature, of our administrators (national and local) to put things right?

Three things are needed. Firstly, a better milk supply; secondly, publicity; and thirdly, cheap milk. Adequate propaganda is impossible until the commodity advertised is reasonably safe or at least until the public know which of the milks offered is safe and which is not safe. The price of milk can be reduced or if (as is possible) the steps taken to improve the supply add to the cost then this reduction of cost (which must take time) should keep the price steady. Anyway I will not enlarge upon the steps required as they are mainly concerned with the industry itself. They include more up-to-date methods of feeding, management of land, of livestock, &c. The Ministry of Agriculture might also help considerably by providing free tuberculin testing for farmers who desired to rid their herds of reactors. The whole question of testing might be clarified and improved. Owners of herds often complain that many veterinary surgeons were trained before the modern technique connected with this test was taught. They know also that the tuberculin on the market is not standardised and that as a result of all this tests are on occasions unreliable.

But there is one aspect which I do desire to examine in detail in this article, one in which readers of THE LANCET can help to educate opinion and help to get a move on. THE LANCET of Dec. 13th, 1930, published a letter signed by Lord Dawson of Penn, Sir Thomas Horder, and other distinguished men. In that letter it was stated that there was "a certain measure of confusion arising from the excessive number of grades." On March 7th, 1931, THE LANCET published a most instructive article by Dr. W. G. Savage, M.O.H. of Somerset, in which he stated that in its practical operation the Milk and Dairies Order in rural districts was largely a dead letter; that much milk was heat-treated with no health objective, but as a trade practice; that there was no obligation to disclose the fact that milk had been heated; and that some milk was actually heated more than once before sale.

Until the public (including medical men) know by the label it carries what the hygienic quality of any sample of milk offered for sale is we shall not get that increased consumption which is desirable in the interest of children, of adults, and of farmers.

CONFUSING CLASSIFICATION.

The whole classification of graded milk needs revision. It should be considered more in the interests of the consuming public and of the producers of clean milk and not so much in the interests of the producers of unsafe or dirty milk. There are too many official designations, particularly as these designations leave the bulk of milk unlabelled. There are now four official designations of *raw* milk and two of *pasteurised* milk—i.e., six altogether. In addition, vendors may add "any old name" (e.g., "Nursery," "Children's," "Invalid") to their milk, although it may be dirty or unsafe.

Too many people have also assumed that by pasteurisation dirty, stale, or decomposing milk can be rendered fit for general consumption even by children. What is officially known as "Pasteurised Milk" may have been clean and fresh, or dirty and stale before it was pasteurised (i.e., no maximum bacterial count *before* pasteurisation is required). Filthy or old raw milk with a high bacterial count can never by mere pasteurisation be made into as good a class milk as reasonably clean raw milk. Then, too, at present a lot of milk which has been heated (but not properly pasteurised) is sold in London and other towns as raw milk. This deception discredits both raw and pasteurised milk.

The present officially recognised designations of milk are: Certified Milk; Grade A (tuberculin tested); Grade A; Grade A (pasteurised); pasteurised.

The number of grades should be reduced. The designations should also be simplified and should not mislead as they do now. For instance, most people to-day imagine that Grade A is the best grade of milk, whereas it is not even second, but is only the third grade. The designations are confusing. How can the ordinary buyer know which is best of the two grades "A., T. T." and "Certified"? What person going into a shop and being confronted with "A," "A., T. T." and "Certified" would know by these designations in what order of merit they should be placed? Simpler designations (e.g., 1, 2, or 3, or A, B, C) should be adopted.

REVISION OF DESIGNATIONS.

The present confusing classification tends to discredit the whole system of grading. Unless it be accurate it will not get public support or achieve its purpose, which is to let the public know what it is paying for. Until the public knows what it is buying the public will not buy as much as it should. Deceiving the public by giving dirty milk a high-sounding name does not help the dairy industry.

The present vendors of Grade A may kick if they are labelled B (or second Grade)—that is to say, if they are taken out of the apparently top class into which they have crept through a misleading designation. But no scheme can be successful so long as it is inaccurate. In any case, there are to-day still only a relatively small number of vendors of graded milk—i.e., there are about 150 licensed to sell Certified milk; 190 licensed to sell Grade A (tuberculin tested) milk; 500 licensed to sell Grade A milk out of a total of well over 100,000 dairy farms.

The longer we wait the more numerically powerful will the vested interests in existing designations become. The problem should be dealt with as soon as possible. But it is no good waiting for the irreconcilable vested interests to agree on a reclassification. Obviously they cannot do so. Yet it is the easy method hitherto adopted by badgered ministers and harassed officials to shelve the whole question.

Classification would be simplified if each separate class or grade covered both raw and pasteurised milk—i.e., the top grade might include both a raw and a pasteurised milk.

The importance of this is not always realised. If all pasteurised milk were lumped into one grade then the standard of cleanliness, &c., *before* pasteurisation would have to be low. But dirt, manure (and the high bacterial count which follows its presence in raw milk) is not really desirable in a beverage even if it is rendered innocuous by subsequent pasteurisation.

In America the tendency has been gradually to compel the pasteurisation of all the lower grades of milk. This took a long time to accomplish, because medical opinion was not at first agreed as to the value of pasteurisation, public opinion had not been educated, and because the trade had not the necessary plant.

LABELLING OF ALL MILK.

Ideally, all milk sold should be officially labelled. Everyone would then know what he was buying. Fancy (unofficial) designations are often dishonest and misleading. It is only the *labelling of all milk* that forces consumers to realise that there are differences in quality and to ask what the different designations mean. It is only the labelling of third-class milk as third-class that induces customers to ask for a higher grade, and so induces farmers to produce clean and safe instead of dirty and unsafe milk. Under such a system retailers are forced automatically to pass the pressure of customers on to the producers and to ask for first-class milk instead of second-class and for second instead of third-class. This is a cheaper and more effective way of obtaining improvement than by depending on a general inspection of farms though naturally some inspection is also needed. It may not be practical politics to label all milk now in the whole country, but the aim of the Government should be to carry such a policy as soon as possible (say in 10–15 years time).

But farmers will resist the compulsory labelling of all milk unless they receive a higher price for the superior grades. To-day most of the milk would be in the lowest grade, and there is really no inducement to farmers to take the extra trouble and to put themselves to the extra expense of producing cleaner milk. It may be hard and costly to produce the top grade: it is relatively easy to raise one's milk from the third to the second grade. Medical opinion can help by making the public realise (1) that milk is a very cheap food, (2) that clean and safe milk is worth a higher price than dirty milk, and (3) that this higher price will still give an article whose nutritional value is cheap by comparison with eggs, beef, fish, &c. When the public is safeguarded more milk will be bought and real propaganda to induce people to drink more liquid milk can be embarked upon.

The expenditure to-day on advertising milk is ridiculously low. £265,000 is spent annually in advertising in the press those patent foods of which milk is merely a constituent. £38,000 is spent on advertising preserved milk, but only £10,000 is spent on fresh milk! Everyone is informed from countless hoardings that a certain stout is good for him, but he is not told that milk is good (and better) for him or her and their child.

THREE NEW GRADES.

What, then, should be the new classification? We should probably look forward to there being ultimately (say in 10–15 years time) only two grades. But it is not feasible to get this now. So the immediate classification must be such that it does not interfere with the ultimate goal.

I think that at the outset there would have to be three grades. The top grade should be (humanly speaking) "absolutely safe." This top grade sets the standard for the lower groups. It is essential to have this grade even though the percentage of milk included in it is at first small compared with the total supply. The bacterial content of the raw milk in this grade must be sufficiently low to guarantee that the milk will keep sweet in summer. Probably nothing over 30,000 bacteria per c.cm. meets this requirement. This raw milk must also be bottled on the farm to prevent any chance of contamination. But this top grade should also include a pasteurised milk. This latter should be from milk which had always been clean, sweet, and fresh—i.e., it must never have had a high (? not over 200,000) bacterial count before pasteurisation and must be from physically examined (? tuberculin tested) cows.

The second grade should be "reasonably good" milk. The raw milk might have a maximum bacterial count of about 750,000 when delivered. It need not be bottled on the farm. Possibly after some years the raw milk belonging to this grade might be dropped as though reasonably safe (i.e., from physically examined cows and with a relatively low count), it could not be absolutely guaranteed. If, however, it were from tuberculin-tested cows it might continue.

The pasteurised milk in this second grade might have a maximum bacterial count of 50,000 when sold to consumers and 750,000 (or 1,000,000) before pasteurisation.

The third grade would be milk which did not come up to the standards of either of these two grades. At first there would have to be raw milk in this third grade, but as soon as possible it should be all pasteurised. In time as the industry improved the whole of this third grade might be eliminated. For a time, however, it would certainly be a necessary group.

CONCLUSION.

I have indicated what might happen in 10–15 years over the whole country after conditions had improved. Meantime I suggest that we should adopt the procedure associated with the development of public health, education, &c.—namely, to empower progressive local authorities to go ahead. After having revised the designations of milk on the lines discussed, Parliament should pass an Act empowering local authorities (county borough councils, borough councils, and perhaps urban district councils) to adopt model milk regulations. These regulations should enable local authorities to compel all milk sold within their area to be labelled in accordance with the official designations. The local authorities might also be empowered by the Order to require all milk offered for sale for delivery to consumers to be delivered in sealed vessels.

Let me summarise the legislative and administrative steps on which the readers of THE LANCET in particular might concentrate: 1. Revise the designations of milk. 2. Empower local authorities to compel all milk sold in their areas to be labelled. 3. Ten to fifteen years hence label all milk.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

A MEDICAL POLICY.

Dr. Jivraj N. Mehta, head of the large and well-equipped independent medical college in Bombay, is one of the leading figures of the medical profession in western India. He recently addressed the Calcutta Branch of the Indian Medical Association on the question of evolving a medical policy for the country, and his views may be taken as representative of a large section of Indian opinion. The subject matter of his address fell under five heads: the provision of medical relief and its organisation; medical education and the standard to be aimed at; medical registration; research; and public health. Dr. Mehta would cut down the existing government services, except in departments such as public health, where it is admitted that a government agency is essential. He quotes the practice of other countries, in which the great bulk of hospital work is carried on by voluntary agencies, and would like to see a great extension of the voluntary system in hospitals. In medical education he emphasises the desirability of providing real specialists, and complains of the existing system—which, however, is rapidly disappearing—of appointing service professors, who may or may not have specialised adequately in their subjects. He draws attention to the need of appointing full-time incumbents for such subjects as anatomy, physiology, and pathology. Here again in many cases action was taken in the government schools long ago. Reviewing the existence of two distinct classes of practitioners—graduates and licentiates—Dr. Mehta has come to the conclusion that it is not at present possible to maintain a uniform standard, and that for some time to come, at all events, it will be necessary to continue both types. But he is in favour of lengthening the course for licentiates, and of diminishing the gulf which at present exists between the two classes. He would also have a minimum standard for registration throughout the country. Dr. Mehta was a sharp critic of the General Medical Council in the controversy over the recognition of

Midwives Board examination was extended from six to twelve months (except for trained nurses) and the curriculum was also somewhat extended. Furthermore the campaign for the lessening of maternal mortality has undoubtedly had a beneficial effect on the midwife's outlook while her fees have increased to from 16*s.* to 30*s.* in East London and from 30*s.* to 50*s.* in West London. Finally it is agreed that throughout the years there has been a growing feeling of professional pride, spread by intercourse through the Midwives Institute and through discussions following the Council's lectures. The old jealousy and undercutting in fees which kept midwives apart is now a thing of the past.

LOCAL AUTHORITIES AND ADVICE ON BIRTH CONTROL.

In a memorandum (153/M.C.W.) issued to maternity and child welfare authorities the Minister of Health states that the Government have had under consideration the question of the use of institutions which are controlled by local authorities for the purpose of giving advice to women on contraceptive methods.

USE OF EXISTING CENTRES.

So far as maternity and child welfare centres (including antenatal centres) are concerned, these centres can properly deal only with expectant mothers, nursing mothers, and young children, and it is the view of the Government that it is not the function of the centres to give advice in regard to birth control and that their use for such a purpose would be likely to damage the proper work of the centres. At the same time the Government consider that, in cases where there are *medical grounds* for giving advice on contraceptive methods to married women in attendance at the centres, it may be given, but that such advice should be limited to cases where further pregnancy would be detrimental to health, and should be given at a separate session and under conditions such as will not disturb the normal and primary work of the centre. Accordingly any proposal for the use of these centres for giving birth control advice in other cases will not be sanctioned.

SPECIAL CLINICS.

Local authorities, it is stated, have no general power to establish birth control clinics as such, but under the Notification of Births (Extension) Act, 1915, which enables local authorities to exercise the powers of the Public Health Acts for the purpose of the care of expectant mothers and nursing mothers, it may properly be held that birth control clinics can be provided for these limited classes of women. Having regard to the acute division of public opinion on the subject of birth control, the Government have decided that no departmental sanction which may be necessary to the establishment of such clinics for expectant and nursing mothers shall be given except on condition that contraceptive advice will be given only in cases where further pregnancy would be detrimental to health.

Under the Public Health Acts, local authorities have power to provide clinics at which medical advice and treatment would be available for women suffering from gynæcological conditions. But the enactments governing the provision of such clinics limit their availability to sick persons, and the Government have decided that any departmental sanction which may be necessary to the establishment of such clinics shall be given only on the following conditions: (1) that the clinics will be available only for women who are in need of medical advice and treatment for gynæcological conditions, and (2) that advice on contraceptive methods will be given only to married women who attend the clinics for such medical advice or treatment, and in whose cases pregnancy would be detrimental to health.

MENTAL HOSPITAL REPORTS.

The Glengall Hospital at Ayr always turns out its annual report with commendable promptitude. On Dec. 31st last it had 653 patients in residence; half of the 200 cases admitted during the year were in a precarious condition, thus taxing the nursing and accommodation in the infirm wards to the utmost. The medical superintendent remarks on the curious anomaly whereby the old-age pension of a certified patient is not available for his maintenance. The recovery-rate was 28 per cent. and the death-rate 13·2 per cent. No less than 22 men and 10 women succumbed to general paralysis during the year, while senile decay accounted for 21 per cent. of the deaths. The general health has been very good, the only infectious disease being one case of diphtheria in a laundry-maid. About four-fifths of the patients were actively employed, while 26 had parole beyond and 37 within the grounds. The visiting commissioners remark on the neatness and orderliness of the patients despite the somewhat overcrowded condition of the institution. Four nurses and two attendants obtained their R.M.P.A. certificates during the year and 48 per cent. are now fully certificated.

The Aberdeen Royal Mental Hospital's report also appears promptly. There were 860 patients on the register on the last day of 1930, including 27 voluntary boarders. Exhaustion was a striking feature in many of the cases on admission. There was a recovery-rate of 21·71 per cent. and a death-rate of 5·66 per cent. The medical superintendent remarks that even now many cases that might have been cured earlier arrive at hospital too late for anything to be done. The general health was good. There was one case of dysentery. The dentist visited weekly and extracted 532 teeth, filled 28 more, and fitted 19 dentures. The occupational therapy department is continuing its work with success and enthusiasm, and a number of patients work out of doors in the grounds. The new verandah is proving very satisfactory as a small sanatorium. A new nurses' home was opened in the summer and the directors have purchased a house for private patients suffering from early and nervous mental disorder.

The Royal Edinburgh Hospital at Morningside is the third Scottish hospital to publish its annual report before the end of February. At the end of last year there were 804 patients at the Royal Edinburgh Hospital and 13 out on trial; there were 57 in the associated nursing homes and 39 at the Jordanburn Nerve Hospital. During the year 349 new patients were seen at the out-patient clinic and the social service worker paid 492 visits. The medical superintendent, in his address, describes the work that is now being done for mental health in Edinburgh. He characterises the trend of treatment to-day as "de-asylumisation" and "hospitalisation." He describes the university clinic for children, where behaviour problems of all kinds are studied; the out-patient clinics; the Jordanburn voluntary hospital; the social service house, and the teaching work at the university. During the last 12 years over £15,000 has been spent.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED *MARCH 21ST, 1931.*

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 219 (last week 171); scarlet fever, 1700; diphtheria, 1045; enteric fever, 22; pneumonia, 2234 (last week

2033); puerperal fever, 49; puerperal pyrexia, 150; cerebro-spinal fever, 84 (last week 59); acute poliomyelitis, 3; encephalitis lethargica, 23; continued fever, 1; dysentery, 14; ophthalmia neonatorum, 97. No case of cholera, plague, or typhus fever was notified during the week.

In the West Riding of Yorkshire 35 cases of cerebro-spinal fever were reported as compared with 26, 28, 21, 41, 22, 12, 19, 5, 11, 5, and 5 in the previous weeks of the year (working backwards). Of these, 7 occurred in four large towns, 18 in ten boroughs and urban districts, 10 in three rural districts.

The number of cases in the Infectious Hospitals of the London County Council on March 24th–25th was as follows: Small-pox, 231 under treatment, 10 under observation (last week 192 and 2 respectively); scarlet fever, 1221; diphtheria, 1735; enteric fever, 172; measles, 126; whooping-cough, 438; puerperal fever, 33 (plus 15 babies); encephalitis lethargica, 121; poliomyelitis, 2; "other diseases" 182. At St. Margaret's Hospital there were 12 babies (plus 7 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 5 (2) from enteric fever, 75 (1) from measles, 5 (0) from scarlet fever, 59 (18) from whooping-cough, 52 (5) from diphtheria, 73 (20) from diarrhoea and enteritis under two years, and 365 (44) from influenza. The figures in parentheses are those for London itself.

Three death from meningococcal meningitis occurred in London, 1 each under one year, from 2–5 and from 15–25 years. The deaths from typhoid were reported from West Ham, Liverpool, and Sunderland. Twelve fatal cases of measles were reported from Liverpool, 8 from Birmingham, 6 from Newcastle-on-Tyne. Liverpool and Newcastle each reported 6 deaths from whooping-cough, Manchester 5. Diphtheria claimed 5 victims at Liverpool, 3 at Birmingham. Eleven deaths from diarrhoea were reported from Birmingham, 8 from Stoke-on-Trent. The 321 fatal cases of influenza outside London are scattered over 83 great towns: 25 were reported from Birmingham, 20 from Sheffield, 19 from Manchester, 14 from Derby, 12 each from Bristol and Stoke-on-Trent.

The number of stillbirths notified during the week was 303 (corresponding to a rate of 43 per 1000 births), including 51 in London.

CORRESPONDENCE

APHTHOUS ULCERS.

To the Editor of THE LANCET.

SIR,—Would you allow me to make use of your columns to inquire whether any of your readers can give me any really useful information as to the treatment, either local or general, of aphthous ulcers of the
uth? These are commonly described as commencing
vesicles, possibly herpetic in origin, which subse-
ntly break down to form the typical grey ulcer
undermined edges. However, they frequently
to occur where the cheek is accidentally bitten.
nd from a friend of mine, who is a patho-
that bacteriological investigation offers no
atter of type of infection.

are extremely painful, and apparently
en and adults or both sexes indis-
hey do not seem to be associated
ils, as is commonly stated, as many
ve apparently clean throats, and in
ils have been previously removed.
in most cases. In women
y to occur before the menstrual
patients, rightly or wrongly,
to taking an excess of sugar.
frequent and numerous as to
dentures impossible, and every
." I know of a case where a
hem more or less continuously
of a very large variety in

ar to be very illuminating.
and borax, potassium
acid, tannin, iodine, alum,
stic stick all give some slight
y of them are extremely
ely successful. The one
, but I have found that
ars to increase the size
nt which has been tried
alkaline treatment for
doses, b.d., increasing,
of Atophan as being
aint, but owing to
in certain patients I

fective treatment for
t gratefully received by the writer and still more gratefully by his patients.

I am, Sir, yours faithfully,

F. A. PHILLIPS.

Lower Sloane-street, S.W., March 30th, 1931.

CEREBRO-SPINAL FEVER.

To the Editor of THE LANCET.

SIR,—The statement in my letter to which Lieut.-Colonel H. M. Perry refers was that it was lamentable that at the present time type sera are not available in this country either for diagnostic *or for treatment purposes.* I had in mind the country in general, not the Army in particular. I did however point out the great advance in the treatment of cases in the Army rendered possible by Dr. M. H. Gordon's researches and the typing of the organisms. Colonel Perry makes no reference to the treatment of the disease by type sera. He simply states that type sera had been available in the Army for the purposes of diagnosis. It would be interesting, therefore, if he would state (1) whether type sera have been available *for treatment* for any of the cases which have occurred in the recent outbreaks in the Army; (2) the types of meningococci which were found in these cases and the case-mortality. If the cases have only been treated with polyvalent serum, we should have an excellent means of comparison of the results now obtained in the Army with those treated with univalent serum mentioned by Dr. Gordon in his letter of Feb. 28th.

I am, Sir, yours faithfully,

A. H. G. BURTON,

March 25th, 1931. Medical Officer of Health, Ilford.

MEDICAL OFFICERS IN THE AIR FORCE.

To the Editor of THE LANCET.

SIR,—In your Parliamentary Correspondent's short report last week (p. 733) of Mr. Montague's remarks in the House of Commons on the deficiency of medical officers in the Air Force there are two errors which though apparently trifling in themselves give a wrong impression of the Service. In the report it is stated that "the deficiency of regular medical officers was, he would see that they were inserted at a later stage.

The amendment was by leave withdrawn.

OTHER AMENDMENTS.

On Clause 16 (prohibitions and regulations with respect to sale of poisons),

Viscount HEREFORD moved an amendment to secure that when poisons were sold in chemists shops under Part II. of the Bill they should be sold under qualified supervision.

Lord PONSONBY accepted the amendment which was agreed to.

Lord COZENS-HARDY moved an amendment to restrict the conditions in paragraph (1) Subsection (2) as to the sales of pharmacies, and to exempt medical men from their application altogether. So far as he could understand this rather complicated clause its affect would be that a doctor who was prescribing for an uninsured person would have to make certain records and keep a book which a doctor prescribing for the millions of insured persons would not have to do. It seemed an unnecessary task.

Lord PONSONBY said this amendment would really be going back on the present position, because the existing law in the Pharmacy Act, 1869, already required medicines prescribed by a doctor to a patient to be distinctly labelled with the name and address of the doctor, and the ingredients to be entered with the name of the person to whom they are supplied in a book to be kept by the doctor for the purpose. This point was discussed at the Home Office conference, and on the whole the representatives of the medical profession preferred not to have any alteration in the present law.

The amendment was negatived.

Lord PONSONBY moved amendments which he said were intended to make it clear that subparagraph (c) in paragraph (II.) of Subsection (3) did not apply to medical practitioners; and in the second place to relax the conditions as to the recording of details in a book in cases where the medicine supplied was a repeat.

The amendments were agreed to.

On Clause 17 (exemption with respect to sales wholesale and sales to certain persons),

Lord PONSONBY moved two amendments. The first amendment specially exempted sales to a doctor from the general requirements of Clause 16. The second amendment proposed that sales by persons doing a substantial business in poisons or persons doing a substantial business in supplying poisons for use in industry should be exempt subject to rules made for the purpose with relation to use in trade or business.

The amendments were agreed to.

On Clause 24 (interpretation),

The Earl of HALSBURY moved an amendment to provide that the word "poison" should be deemed to include any substance which in the opinion of the Poisons Board was dangerous if taken without medical supervision or prescription. He said he would not press the amendment if Lord Ponsonby would undertake to consider the matter before the Report stage.

Lord PONSONBY said he would be much obliged to the noble earl if he would leave the matter like that. He certainly intended to have this matter gone into very carefully, but he would point out that they had to steer a rather difficult course, because they had the medical profession watching very closely, and they had to carry the medical profession with them as well. He did not hold out any hope that he would be able to make any drastic alteration, but he would certainly look into the matter.

THE POISONS BOARD AND ITS CONSTITUTION.

The amendment was by leave withdrawn.

On the first schedule (constitution of Poisons Board),

The Earl of HALSBURY moved to leave out the first paragraph which states that the Board shall consist of 14 members, and that the Secretary of State may from time to time appoint additional members not exceeding four in all. He said that he was anxious to maintain the balance of the Board so that the majority vote would lie with the experts and not with Whitehall officials. Their lordships had thought fit to give complete and absolute control to the Secretary of State. Why should they not have at least a Board which was controlled by experts? A firm in Constantinople were employing nothing but research chemists in order to see if they could discover some veronal-medinal group. The Departmental Committee went out of their way to say something about that question. For lack of proper advice it might be that whatever this firm discovered would not be placed on the poisons list. There would be a long delay before the Poisons Board dealt with it, and eventually the drug manufacturers would have something else up their sleeve to put on the market, and so the matter would go on. He urged that they ought to have on the Poisons Board somebody representing the Chemical Society who could advise as to whether any particular substance that came on the market should be put in the poisons schedule.

Lord PONSONBY said the matter raised by the noble earl was important, but whatever political party the Home Secretary might belong to he might be trusted in these matters to act with the greatest care. It was not likely that any Home Secretary would appoint Tom, Dick, or Harry to the Board. The four additional members would not be officials. With regard to the medical profession the matter was discussed at the Conference at the Home Office, and it was agreed that there should be an additional representative of the medical profession nominated by the British Medical Association. The constitution of the Board as it stood in the Bill was satisfactory, and would meet what the noble lord felt to be necessary.

The amendment was by leave withdrawn.

The Committee stage of the Bill was concluded.

YARMOUTH NAVAL HOSPITAL BILL.

ON Friday, March 27th, Mr. AMMON (Parliamentary Secretary to the Admiralty) moved the second reading of the Yarmouth Naval Hospital Bill, which, he said, was non-controversial, and had passed through the House of Lords. It was urgently needed both by the Admiralty and the Ministry of Pensions. The main object of the Bill was to remove any doubt regarding the legal position of the hospital in which there were now accommodated mental patients.

Mr. MACPHERSON opposed the Bill on the ground that it was an inroad into the rights and liberties of the subject. Unless there was a promise of radical amendment in Committee he would vote against the measure.

Major TRYON said that the House was entitled to receive a good deal more information about the Bill.

Mr. ERNEST BROWN moved the rejection of the Bill.

Lieut.-Colonel FREMANTLE thought that the Bill ought to be passed as a provisional measure, subject to a full explanation that it was intended to improve the hospital in the interests of the patients.

Mr. AMMON, replying to the debate, said that this hospital had always been a voluntary one. There was no question of compelling patients to go there against their will, or against the wish of their friends and relatives.

The motion for rejection was withdrawn, and the Bill was read a second time and committed to a Committee of the whole House. The necessary money resolution was agreed to in Committee.

COMPULSORY VACCINATION.

In the House of Commons on March 30th Mr. GROVES presented a Bill to repeal the law relating to compulsory vaccination.

HOUSE OF COMMONS.

WEDNESDAY, MARCH 25TH.

Contagious Disease in the Navy.

Lieut.-Colonel Fremantle asked the First Lord of the Admiralty what reduction there had been in the incidence of contagious diseases in the Navy during the last six years; and what steps were taken especially to bring entrants and lads in the training establishments under the influence of intensive and comprehensive educational schemes with a view to the prevention of such diseases.—Mr. Ammon replied: I presume that by "contagious diseases" venereal diseases are referred to. The reduction (or increase) in the incidence of these diseases in the Navy, during the last six years, is set forth in the following table:—

Incidence of Venereal Disease (Fresh Infections) for the years 1924–29.

Year.	No. of cases.	Ratio per 1000 of strength.	Increase or decrease compared with previous year.
1924	5987	68·32	10·19 decrease.
1925	5412	60·16	8·16 "
1926	5184	57·18	2·98 "
1927	5341	57·28	0·10 increase.
1928	5160	56·81	0·47 decrease.
1929	5312	61·91	5·13 increase.

Comprehensive educational schemes are in force in the training establishments. In the general depots, all new entries receive special instruction. In boys' training establishments, very special care is taken to ensure adequate and suitable instruction in sex hygiene. This instruction forms part of the general scheme of moral training, and is carried out, in close coöperation, by the divisional executive officers, the chaplains and medical officers of the establishments concerned. Moreover, thorough instruction, especially with regard to venereal diseases and their dangers, is imparted to those boys before they are drafted to sea-going ships.

Lieut.-Colonel Fremantle: Is it not a fact that the rate of reduction of these most serious diseases has stopped during the last six years, and that the Admiralty are taking no special steps to deal with the situation?

Mr. Ammon: No, I think that the hon. Member will find that that is not quite borne out by the information.

Lieut.-Colonel Fremantle: Are the Admiralty taking full steps to avail themselves of the offer of the British Social Hygiene Council to give them help which has been so useful elsewhere?

No further answer was given.

Dead Children Found in Hong-Kong Streets.

Mr. Graham White asked the Under-Secretary for the Colonies whether, seeing that an average of more than 1300 bodies of dead children were picked up in the streets of Hong-Kong each year, he would call for a report from the governor of Hong-Kong as to what verdicts had been given at the inquests held upon these children; and what administrative steps were being taken to bring to trial those who were alleged to be responsible.—Dr. Shiels replied: My noble friend inquired into this matter some little time ago. In a despatch dated May 22nd, 1930, the governor informed him that every abandoned corpse is removed to the public mortuary for post-mortem examination, but in almost every case no cause is discovered for suspicion that the death resulted from other than natural causes. Every case is reported to the coroner, but the governor states that in no single instance in 1928 did the coroner see any necessity for a formal death inquiry. In the circumstances my noble friend does not propose to call for a further report of the nature suggested by the hon. Member.

Mr. White asked Dr. Shiels whether, whatever might be the causes, he could not assure the House that some steps would be instituted which would put an end to a state of things which without exaggeration was appalling.

Dr. Shiels: I quite agree that it is very unsatisfactory. I understand that in the main these happenings are due, in some cases, to fear of inquiries as to infectious disease orders, and in other cases to save the expense of burial. My noble friend has gone into the matter and drawn the governor's attention to it, and I believe that everything possible is being done.

Maternal Mortality in India.

Miss Rathbone asked the Secretary for India the rate of maternal deaths per 1000 confinements in British India during last year, or for the most recent year for which figures were available.—Mr. Wedgwood Benn replied: Figures are not available for the whole of British India. But to take a few illustrative cases, the ratio of maternal deaths per 1000 live births in 1927 was 12 for Madras Town, and 5·3 for Madras Presidency; 5 for Bombay City and 5·4 for the Presidency. When copies of the Public Health Commissioner's Report for 1928 are received I will have one placed in the library.

Miss Rathbone asked if the right hon. gentleman had any reason to think that these figures could be complete in view of the statement of the representative of public health in Madras that 20,000 is a very moderate estimate of the number of maternal deaths?

Mr. Benn said he had given the official figures, which he had no doubt were accurate.

THURSDAY, MARCH 26TH.

Abolition of Night Baking.

Miss Lee asked the Home Secretary when it was proposed to proceed with legislation to abolish night baking.—Mr. Clynes replied: It is the intention of the Government to deal with this matter in the Factories Bill.

Convictions for Drunkenness.

Captain Crookshank asked the Home Secretary how many convictions for drunkenness there were in Carlisle in 1928, 1929, and 1930.—Mr. Clynes replied: The figures are shown in the annual volumes of licensing statistics, and for 1928 and 1929 were 60 and 56. The volume for 1930 is not yet complete, but the figures may be given provisionally for Carlisle as 81.

Domiciliary Treatment of Sick Poor.

Dr. Hastings asked the Minister of Health the number of local authorities that have, in accordance with the provisions of the Local Government Act, 1929, assigned to their public health committees the domiciliary treatment of the sick poor.—Miss Susan Lawrence replied: Provision to this effect has been made in the administrative scheme of eight local authorities.

Maternity and Child Welfare Services.

Mr. Day asked the Minister of Health whether he could state the estimated total grant payable by his department during the present financial year towards maternity and child welfare services, giving the comparable figures for 1928.—Miss Susan Lawrence replied: I would remind my hon. friend that under the Local Government Act, 1929, separate grants for maternity and child welfare services, other than the training of midwives and health visitors, ceased to be payable in respect of any year after the financial year 1929–30. The amount of the discontinued grant paid for these services during the year 1928–29 was £1,047,890, and this amount was included in determining the loss on account of grants under the Act.

MONDAY, MARCH 30TH.

Washington Convention.

Sir T. Inskip asked the Prime Minister whether it had been decided by H.M. Government to ratify the Washington Hours Convention as it stood without any reservation, condition, or statutory interpretation.—Mr. MacDonald replied: The Government's policy is to ratify the Convention without reservation or condition. The Convention requires legislation to give it statutory effect, and the Hours of Industrial Employment Bill has accordingly been introduced.

Hours of Industrial Employment.

Sir T. Inskip asked the Prime Minister whether it was proposed to take any further stages of the Hours of Industrial Employment Bill at an early date; and whether he could make any statement as to the obstacles which had prevented any progress with the Bill since its re-introduction last November.—Mr. MacDonald: The Government proposes to take the further stages of the Hours of Industrial Employment Bill at the earliest practicable date. The hon. and learned Member may be aware that pressure of other business has made it impossible hitherto to proceed with the Bill.

Patent Medicines.

Dr. Hastings asked the Secretary to the Treasury whether he would order the reprinting of the Report of the Select Committee on Patent Medicines, 1914.—Mr. Pethick-Lawrence (Financial Secretary to the Treasury): The cheap edition of the report of the Select Committee on Patent Medicines, 1914, has been out of print for some years, and there is no evidence before me that there is a substantial demand to justify a reprint. The full edition, containing the proceedings and minutes of evidence, is still available.

Production of Opium.

Mr. CAMPBELL asked the Home Secretary whether, at the conference to be convened by the League of Nations at Geneva next May on the limitation of the manufacture of dangerous drugs, the production and distribution of opium would be included in the purview of the conference.—Mr. SHORT: No, Sir. The question of limiting the production of raw opium is outside the scope of the conference.

Dumping of Refuse.

Mr. MILLS asked the Minister of Health if he intended to bring in a Bill to put an end to the nuisance and annoyance caused by the dumping of house refuse by one sanitary authority in the area of another sanitary authority without the latter authority's consent.—Miss LAWRENCE (Parliamentary Secretary to the Ministry of Health): It is not proposed to bring in a Bill this session for dealing expressly with the dumping of refuse. I may say, however, that the Town and Country Planning Bill recently introduced will strengthen the hands of the planning authorities in preventing or controlling the use of land for such a purpose. Local authorities may also prevent nuisance if by-laws dealing with the disposal of refuse are made betimes and strictly enforced.

Over Seven Years' Cases.

Sir F. HALL asked the Minister of Pensions the number of applications submitted from ex-Service men for pension since the decision of the Government to abolish the seven years' limit; the number of such applications which had been admitted and pensions granted; and whether the Government would make a further notification of their decision in respect of the over seven years' cases in order that ex-Service men might know that, notwithstanding the lapse of seven years, they might, if satisfied that they had good grounds, apply for disability pension.—Mr. HAYES replied that during the 15 months since November, 1929, some 22,800 applications had been received in respect of fresh disabilities, including an undetermined number of renewed applications. During the same period, 1210 cases had been recognised by way of medical treatment or the award of compensation in the form of pension or other pecuniary grant. Full publicity had been given to the decision referred to, which the Minister of Pensions had every reason to believe was well known, and a further announcement at the present time would, in his view, serve no useful purpose.

MEDICINE AND THE LAW.

The Christie Will Case.

Lord Merrivale's judgment in the lengthy and expensive litigation in the Christie case is an admirable illustration of the law of testamentary capacity. The law assumes the sanity of a testator and—at any rate until Miss Rathbone's Wills and Intestacies (Family Maintenance) Bill is passed—places no restriction on his complete freedom of disposition. An eccentric will, or a harsh will which capriciously disinherits wife and children in violation of moral obligations, is not invalid provided that the testator has what lawyers call a "sound disposing mind." Lord Merrivale has repeated with approval the observations of Chief Justice Cockburn in Banks *v.* Goodfellow in 1870. The testator must not only be able to understand that by his will he is distributing his property to one or more objects of his regard. He must also have capacity to comprehend and recollect the extent of his property and the nature of the claims of others whom by his will he is excluding from participation. It is essential that no disorder of the mind should poison his affections, pervert his sense of right or prevent the exercise of his natural faculties. No insane delusion must influence his intention in disposing of his property and bring about a disposition which, had the mind been sound, he would not have made. In Mr. Christie's case the President found that the testator was a man of vigorous health and dominating personality until 1914 when he suffered from pneumonia. In 1918 he had a stroke; later, other attacks followed and his disability increased. Speech became difficult; it was limited to single words which were not easily produced. In June, 1924, he was certified as of unsound mind and was removed to a mental home though he was taken away soon afterwards. In August his wife was appointed receiver of the estate. There was local indignation and efforts were made to set aside the receivership order. The Lunacy Commissioners sent visitors, so that considerable expert evidence was available later. In January, 1925, Mr. Christie made a will disinheriting his wife and son. The solicitor, who had taken his instructions, adopted the unusual but prudent course of causing four medical practitioners to be present at the execution of the will. Two of the doctors witnessed the signature; all four vouched that they were satisfied of his capacity. They had heard the will read over to him; they had been encouraged to ask questions and they had tested his knowledge of what he was doing. A number of local witnesses gave evidence at the trial that the squire, as they called him, was sane in spite of his aphasia, that they themselves always understood what he wished to say, that he in turn understood them, that he never said or did a foolish thing, that he was a shrewd judge of cattle, and so on. Lord Merrivale was evidently impressed by this evidence. It was not, he said, till he finally heard the evidence of the wife in the later stages of the trial that he doubted whether Mr. Christie had known and approved the contents of his 1925 will. After hearing her evidence the President found himself unable to be certain of the testator's sound disposing mind; the burden of proof rested upon the parties who were propounding the 1925 will; that burden was not discharged, and so Lord Merrivale pronounced against the 1925 will and in favour of an earlier will of 1901 under which the wife was made sole executrix and universal legatee. The President found that the testator, by reason of the progressive deterioration of the brain, due to arterio-sclerosis, was wholly insane and unaccountable for his actions in 1924. "I am satisfied that Mr. Christie was suffering from a progressive disease which affected his mental faculties; it deprived him of the means of knowledge, of the scope of knowledge and of the capacity for judgment which were necessary to give him testamentary capacity. With regard to his wife and son, whom the will of 1925 was intended to dispossess, he had an insane delusion that they hated him." This last sentence, we may assume, contained the crucial finding. A mere mistaken conclusion by the husband that his wife and son hated him would not have invalidated the will. But, in the language of Banks *v.* Goodfellow, disorder of the mind had poisoned the testator's affection, perverted his sense of right, and prevented the exercise of his natural faculties.

Medical practitioners who have the misfortune to be concerned in disputes of this nature will know the bitterness which can be reflected in forensic comment and cross-examination. It was suggested that the medical adviser on whom the wife had relied in the measures taken for Mr. Christie's health, safety, and supervision, had been complacently ready to certify insanity without proper ground, and had assisted the wife to reduce her husband to a state of pitiful ignominy and hopelessness for her own mercenary ends. Lord Merrivale's extensive judgment takes the opposite view. He makes it clear that the wife and doctor "were doing their best in circumstances of indescribable difficulty, and believed what they have since come here and said."

MEDICAL NEWS

University of Oxford.

On March 28th the following degrees were conferred :—

D.M.—D. G. Leys and R. Lewthwaite.
B.M.—T. M. Davie, E. Harvey, and K. N. Irvine.

Royal College of Physicians of London.

At a meeting of the College on March 30th Lord Dawson of Penn was elected President. Sir John Rose Bradford, as retiring President, delivered the presidential address for the past year.

Lord Dawson was appointed to represent the College at the forthcoming Centenary Celebrations of the University of Leeds on June 30th and July 1st, and Dr. William Hunter was nominated to represent the College at the forthcoming congress of the Universities of the Empire to be held in London and Edinburgh in July.

The undermentioned diplomas were granted, jointly with the Royal College of Surgeons, to the following candidates :—

Diploma in Tropical Medicine and Hygiene.—N. J. Abbensetts, Mohammad Akram, James Cairns, H. G. Calwell, C. P. Campion, M. M-D. Chughtai, G. J. Clarke, Annie E. Connan, Sonti Dakshinamurty, David Ellis, Mohamed El Huseini, H. G. Floyd, J. R. Jensen, W. P. Jones, Rajmal Kasliwal, Ah Ma, T. T. Mackie, E. W. Martindell, Alexander Mearns, P. B. P. Mellows, Myrtle Noronha, Socrates Noronha, Muttukumaru Sangarapillai, D. W. Semmens, Saravanamuttu Thambiah, R. B. Wallace, Janet Welch, Ethel M. Weir, G. F. West, and W. A. Wilson.

Diploma in Ophthalmic Medicine and Surgery.—Shaikh Atta-Ullah, B. P. Danard, H. D. Dastoor, T. E. Davies, John Foster, Dorothy Guest, James Hill, Herbert Kaitz, Mohanlal Kalra, J. G. Kshatri, Ivan Marais, G. R. Marcano, M. S. Mehkri, H. G. Nimbalker, K. J. O'Day, V. P. Patel, F. G. Roberts, and A. L. Sutherland.

The College will be closed from Friday, April 3rd, to Tuesday, April 7th, both days inclusive.

University of Leeds.

At recent examinations the following candidates were successful :—

M.D.

S. J. Hartfall (with distinction), J. C. Lamont, and W. A. D. Lawson.

FINAL EXAMINATION FOR M.B., CH.B.

Part I.—H. Agar, Doris B. Brown, H. Featherman, E. Gledhill, J. S. Gourlay, Gwendolen Harrison, H. Hart, F. R. W. Helmsley, Ruth Hooton, E. James, M. Lask, J. Littlewood, I. Macpherson, J. Q. Mountain, I. Rosenberg, M. Rosenthal, L. W. Russell, M. Shankhla, S. Strasburg, S. Suvi, and J. Taylor.

Part II. (New Regulations).—J. E. Abell, P. R. Allison, E. L. Brittain, J. M. P. Clark, J. L. Coleman, F. B. T. T. Drake, J. Fielding, L. Glick, R. A. Hall, G. P. Holderness, J. M. Holmes, G. Hyman, G. Marquis, H. Mattison, M. R. Potter, L. J. Richmond, S. Rosenbloom, N. Ross, J. Scholefield, B. Schroeder, P. Science, J. Shapiro, and F. R. Staub.

Part III. (New Regs.)—P. R. Allison (First Class Honours), J. E. Abell, E. L. Brittain, J. M. P. Clark, J. L. Coleman, F. B. T. T. Drake, J. Fielding, R. A. Hall, G. P. Holderness, G. Marquis, M. R. Potter, L. J. Richmond, S. Rosenbloom, N. Ross, J. Scholefield, P. Science, J. Shapiro, and F. R. Staub.

Part III. (Old Regs.)—J. Kak.

FINAL EXAMINATION FOR B.CH.D.

M. R. Hollings.

FINAL EXAMINATION FOR L.D.S.

I. Levey, A. B. Levie, Reca R. Lieberman, S. Slater, P. W. Thornton, and J. Todd.

D.P.H.

H. S. Carter and R. C. Holderness.

University of London.

At a meeting of the Senate on March 25th it was resolved to institute a university chair of experimental pathology tenable at the Cancer Hospital (Free).

London Light and Electrical Clinic.

At the annual general meeting of the British Humane Association recently held it was reported that the London Light and Electrical Clinic continues to be the main activity of the Association. There was an increase of 45,000 treatments over the previous year, and out of the 173,000 treatments administered some 5000 were given free to people unable to afford any contribution. The Private Clinic has, it was stated, given satisfactory results and has fully justified the experiment. Among the new features during the year has been the extension of the laboratory side of the work, and Sir Leonard Hill has been appointed hon. research director, with Dr. A. Eidinow to assist him. The use of the clinic as a training centre had been developed by the institution of post-graduate courses for doctors, and arrangements are being made to appoint visiting physicians to the clinic.

University of Manchester.

At a recent examination for the Diploma in Public Health (Part II) Dr. Elsie Catlow was successful.

Fellowship of Medicine and Post-Graduate Medical Association.

The annual general meeting of this association will be held at 1, Wimpole-street, London, W., at 5.30 P.M., on Monday, April 13th.

Royal Navy Medical Club.

The annual dinner of this club will take place at the Trocadero Restaurant, Piccadilly-circus, on Thursday, April 16th, at 7.30 for 8 P.M. Members who wish to be present are asked to inform the hon. secretary at Queen Anne's Chambers, Tothill-street, London, S.W.1, not later than seven clear days beforehand.

Auxiliary R.A.M.C. Funds.

The annual meeting of the members of the Auxiliary R.A.M.C. Funds will be held at 5 P.M. on Friday, April 17th, at 11, Chandos-street, Cavendish-square, W.1, when the annual report will be presented and the officers and committee for the current year elected.

West London Medico-Chirurgical Society.

The Cavendish lecture of this society will be delivered on June 5th at the Kensington Town Hall by Prof. Julian Huxley, whose subject will be Development in Relation to Heredity and Evolution. The next meeting of the society will be at the De Vere Hotel, Kensington, on April 10th.

Journées Médicales de Bruxelles.

The eleventh meeting of this congress will be held at Brussels from June 20th to 24th under the presidency of Prof. Auguste Ley. It is dedicated to the memory of Fernand Widal. The secretary-general is Dr. Beckers, 145, rue Belliard, Bruxelles.

Medical Superintendents' Society.

The annual dinner was held at the Holborn Restaurant, London, on March 27th. Eighty-four members and guests sat down under the chairmanship of Dr. E. W. G. Masterman. Amongst the visitors were Sir Arthur Newsholme, Sir William Barber, Dr. John Tate, and Dr. J. A. H. Brincker, Dr. Allen Daley, and Dr. Letitia Fairfield, representing the headquarters medical staff of the London County Council. Sir Arthur Newsholme responded to the toast of "The Visitors."

International Congress for Light.

The Congrès International de la Lumière will hold its second meeting from August 15th to 18th, 1932, at Copenhagen, under the presidency of Dr. A. Reyn. Its purpose is to consider biological and biophysical research on light and light treatment. Any doctor or physicist may become a member of the congress. The preliminary programme may be had from the secretary-general, Dr. A. Kissmeyer, Finsens Lysinstitut, Copenhagen.

National Council for Mental Hygiene.

The second biennial conference on mental health will be held at the Central Hall, Westminster, from May 27th to 29th. The subject of discussion will be the human factor as it affects international problems, crime, industry, the social services, and education. The medical speakers will include Sir Hubert Bond, Mr. C. J. Bond, Dr. H. Crichton-Miller, Lieut.-Colonel J. R. Lord, Sir David Munro, Dr. W. A. Potts, and Dr. F. C. Shrubsall.

Paying Patients.

The scheme for paying patients at Sunderland Royal Infirmary has been so successful that it is to be extended. In future the scheme will be open to single persons with one or more dependents wholly maintained by them and married couples without children under 16, up to £100 per annum; widows and widowers with a child or children under 16, up to £400 per annum; married couples with a child or children under 16, up to £500 per annum. By paying 30*s.* per year, either half-yearly or yearly—and in the case of single persons between 16 and 21 years in receipt of less than £100 per annum, 20*s.* per year—those who join the scheme together with dependants under the age of 16 years will be entitled, after six months from payment of the first premium, to free hospital treatment, including physicians' and surgeons' services, in the private wards of the Infirmary.—A proposal to provide pay-beds in the Liverpool Maternity Hospital is under consideration.

A Guild of Gratitude.

When the Royal Eye Hospital, Waterloo-road, S.E., was in a serious financial position some years ago the patients formed themselves into a Guild of Gratitude to raise money for its assistance. At the annual meeting of the guild recently it was reported that during the past 12 months the membership had increased from 16,000 to over 22,000, and that £995 was subscribed, making a total from the beginning of £3605. More than £75 has been given in farthings.

Violet Melchett Infant Welfare Centre.

The Queen last week opened the Violet Melchett Infant Welfare Centre in Wellington-street, Chelsea, founded by the late Lord Melchett, who bought the site and provided £43,000 for the erection of the model building. The centre at present stands alone in its features and is the largest benefaction of its kind yet made in England. The building comprises a day nursery accommodating 50, where children may be left for a shilling a day, a mothercraft training home, and an infant welfare centre. The central hall is used for welfare consultations, and the staff consists of matron, sister, three staff nurses, and 13 pupil nurses.

Manfield Orthopædic Hospital.

The report for 1930 of this Northampton hospital states that the institution has constantly been full to overflowing, the whole of its 128 beds being always occupied. During the year 243 patients were admitted, and 1308 persons attended the out-patient clinics. When the hospital was founded in 1925 there were 358 cripples on the register of the Northampton and County Crippled Children's Fund. Since then, 1284 new cases have been entered, and at the end of 1930 there were 1212 patients on the clinic registers. There is no adequate accommodation for dealing with an epidemic, and an isolation ward is also needed so that cases of infantile paralysis can be admitted in the acute infectious stage.

Enlargement of Nottingham General Hospital.

Lord Moynihan last week opened a new children's ward and a new theatre which have been added to this institution, at the cost of Mr. W. G. Player and Sir Louis Pearson respectively. Lord Moynihan, who made a vigorous defence of the voluntary hospitals which, he said, were creating more than 1000 new beds every year and were rather more than paying their way, expressed a strong desire for the addition of a medical school to the hospital.

Mental After-Care Association.

The annual meeting of this association was held in London on March 25th, with Lord Wakefield, the President, in the chair. Dr. Reginald Worth was elected chairman of the Council in the place of Sir Maurice Craig, who has resigned. In presenting the annual report Dr. Worth stated that the council was anxious to enlarge the work of the association by widening its activities until after-care work is established in connexion with every mental hospital in the kingdom. Already work is done in direct coöperation with one hundred mental hospitals, which represent more than half the mental hospitals in England and Wales. During the past year 410 patients were referred to the association for early treatment, in the preceding year the number was 161. Cottage homes are provided for both early care and after cases, and assistance is also given in re-establishing recovered patients in ordinary life, finding suitable occupation for them, helping them with outfits, tools, and money until they can be set upon their feet again as useful members of society.

Royal Interest in Hospitals.

On Tuesday, last week, the Duchess of York opened a new ward, named after Princess Elizabeth, in the Queen's Hospital for Children, Hackney-road, Bethnal Green. Accommodation is provided for 26 children, and it is now, for the first time, possible to segregate children under the age of 5; rooms have been provided for the reception of three nursing mothers. The ward has been built by a grant of nearly £9000 from the balance of the Children's Jewel Fund of £60,000 raised by gifts of jewellery to relieve the sufferings of children during the war. The largest contribution to that fund was a string of pearls from the Duchess of Marlborough, which realised £8000, and the smallest, a coral button which was sold for twopence. On Thursday the Duke and Duchess of York visited the Lancashire and Cheshire Tuberculosis Colony at Barrowmore Hall, near Chester, and the Duchess opened the King George V. Thanksgiving Block at the Chester Royal Infirmary. The new building contains a pathological department and a suite of three theatres. On the same day Princess Mary opened a new children's ward at Durham County Hospital. When the Princess was married she handed over £1145, the bulk of the wedding present from the city of Durham, towards the provision of a children's ward.

Victoria Park Hospital.

At the annual meeting last week of the City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, it was stated that the expenditure—£36,220—exceeded the income by nearly £1500, and that as the investment income is little more than £2000, constant efforts are needed to avoid deficiencies. The convalescent home at Saunderton has had to remain closed for the last five years, and the governors have consequently felt impelled to take steps to sell it.

Vacancies

For further information refer to the advertisement columns.

Ashton-under-Lyne District Infirmary.—H.S. At rate of £150.

Barnstaple, North Devon Infirmary.—Res. M.O. At rate of £150.

Bedford County Hospital.—H.S. At rate of £175.

Belgrave Hospital for Children, 1, Clapham-road, S.W.—H.P. and H.S. Each at rate of £100.

Birkenhead General Hospital.—H.P. £100.

Birmingham City Babies' Hosp.—Jun. Res. M.O. At rate of £100.

Birmingham City Maternity and Child Welfare Dept.—Three Temp. M.O.'s. £10 per week.

Birmingham, Ear and Throat Hospital, Edmund-street.—H.S. for Out-patient Dept. At rate of £150.

Birmingham General Hospital.—Two Res. Anæsthetists. Eac £120. Three H.S.'s. Each £70.

Birmingham, Selly Oak Hospital.—Res. Physician. £550.

Bradford Children's Hospital.—H.S., and H.P. Each £120.

Brighton, New Sussex Hosp. for Women and Children.—H.P., H.S. Each at rate of £50. Also Hon. Asst. Ophth. Surg.

Brighton, Royal Sussex County Hospital.—Cas. H.S. £120.

Bristol, Brentry Colony for Mental Defectives, Westbury-on-Trym Res. Med. Supt. £650.

Bristol General Hospital.—Sen. Res. M.O. £200.

Bristol University.—Lectureship in Physiology. £300–£400.

Bury Infirmary, Lancs.—H.S. to Special Depts. At rate of £200.

Bury St. Edmund's, West Suffolk General Hospital.—H.S. £180.

Chester Royal Infirmary.—H.S. £150.

Ealing Borough, Maternity and Child Welfare Services.—Asst. M.O. £450.

Gloucester, Gloucestershire Royal Infirmary, &c.—Res. Surg. O., and 1st H.S. At rate of £200 and £150 respectively.

Hampstead General and North-West London Hospital, Haverstock hill, N.W.—H.S. At rate of £100.

Harrogate Royal Bath Hospital, &c.—H.P. At rate of £156.

Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—H.P. At rate of £50.

Hull Royal Infirmary.—H.S. to Ophthal. and Ear, Nose and Throat Depts. At rate of £150.

Ilford Borough Council.—Asst. School Dental Surgeon £450.

Kincardine, County of.—Deputy M.O.H. £600.

Leamington Spa, Warneford General Hospital.—Res. H.P. £165.

Liverpool, Royal Children's Hospital.—Res. H.S. At rate of £100.

Liverpool Royal Infirmary.—H.S. to Orthopædic Dept. £60.

Liverpool Stanley Hospital.—H.P. and H.S. Each £100.

London Jewish Hospital, Stepney-green, E.—Hon. Asst. P.

Maidstone, Kent County Ophthalmic and Aural Hospital.—Ophthalmologist. £250.

Manchester, Ancoats Hospital.—H.S. At rate of £100.

Manchester Ear Hospital, Grosvenor-square, All Saints.—Non Res. H.S. At rate of £150.

Middlesex C.C.—District M.O. £80. Also Public Vaccinator.

Newark General Hospital.—Res. H.S. £175.

Newcastle-upon-Tyne, Hospital for Sick Children.—H.S. At rate of £100.

Norwood and District Cottage Hospital.—Hon. Medical Officer to X Ray, &c., Dept.

Nottingham General Hospital.—H.S. At rate of £150.

Oldham Royal Infirmary.—H.S.'s to Special Depts. Each at rate of £175.

Oxford, Warneford Mental Hospital.—Asst. M.O. £300.

Plymouth, South Devon and E. Cornwall Hospital.—H.S. At rate of £100.

Poplar Hospital for Accidents, East India Dock-road, E.—Sen. Res. O. £200.

Radium Institute, Riding House-street, W.—Res. Surg. Reg. At rate of £250.

Reading, Royal Berkshire Hospital.—Cas. O. and Res. Anæsthetist. Each at rate of £150.

Rochdale Infirmary and Dispensary.—Jun. H.S. £200.

Rotherham Hospital.—Cas. H.S. £120. Hon. Surgeon to Ear, Nose and Throat Dept. Also Hon. Dental Surgeon to Out-patients' Depts.

Royal Chest Hospital, City-road, E.C.—Out-patient M.O. At rate of £100.

Salford City Infectious Diseases Hosp.—Jun. Asst. Res. M.O. £200.

St. Mark's Hospital for Cancer, &c., City-road, E.C.—H.S. At rate of £75.

St. Mary's Hospital for Women and Children, Plaistow, E.—Asst Res. M.O. At rate of £120.

Scarborough Hospital and Dispensary.—Two H.S.'s. Each £175

Shanghai Municipal Council—Public Health Dept.—Asst Pathologist. 650 Tls per mensem.

Staffordshire General Infirmary.—H.P. £150.

Swansea General and Eye Hospital.—Cas. O.

University College Hospital, W.C.—Hon. Clin. Asst.

University College Hospital Medical School, University-street W.C.—Beit Memorial Fellowship for Medical Research £400.

Wakefield, Clayton Hospital.—2 H.S.'s. Each at rate of £200.

Wallasey Victoria Central Hospital.—Jun. H.S. At rate of £100.

Walsall General Hospital.—H.S. At rate of £150.

Willesden General Hospital, N.W.—Hon. Clin. Assts. Also H.P At rate of £100.

NOTES, COMMENTS, AND ABSTRACTS

TREATMENT OF RHEUMATOID ARTHRITIS.*

By A. H. Douthwaite, M.D., F.R.C.P. Lond.,
ASSISTANT PHYSICIAN TO GUY'S HOSPITAL.

Rheumatoid arthritis is a disease largely confined to women of child-bearing age, and it offers certain clinical features which render its recognition a matter of no great difficulty. For convenience it may be regarded as presenting three stages of development. In the first, joint involvement is trivial or even absent, morbid manifestations emerging as it were almost insensibly from the diathetic background of constitutional deviations from the normal. Thus we find that in childhood the patients have suffered from such disorders as urticaria, recurrent "bilious" attacks, and undue fatigue after exertion, and have, nevertheless, been mentally unusually alert and often regarded as "highly strung." After some debilitating illness, such as influenza, the first signs of rheumatoid arthritis appear, and are usually evanescent and composed of fleeting pains in the limb muscles. The peripheral circulation, always sluggish, becomes more so, producing cold extremities on which erratic sweating occurs. The main signs at this stage are of muscular rheumatism, stiffness in the morning—passing off as the limbs are exercised—tenderness of the muscle bellies, and possibly slight swelling of the finger joints in damp weather.

Investigation reveals an abnormally low blood pressure and an unstable pulse-rate; patchy pigmentation of an otherwise waxy-coloured skin; clammy, cold hands, and blue fingers; visceroptosis and constipation; exaggerated tendon reflexes and twitchings and wasting of the limb muscles. The patient, who has always been of spare build, now notices a progressive loss of weight, and the general appearance of ill-health is always very striking, forming a marked contrast to that of the osteo-arthritic. Special investigations demonstrate a raised basal metabolic-rate and a lowered sugar-tolerance which, in conjunction with the skin, cardiovascular, and nervous changes, suggest that hyperactivity of the thyroid plays an important part in the production of symptoms.

Recently, the discovery by Oriel of a proteose in the urine of these patients, often associated with the presence of large numbers of late-lactose-fermenting bacilli in the fæces, has brought us a stage further in understanding this complex subject. The importance of the urinary proteose lies in the fact that when introduced into the skin of the patient in dilutions of one in a million, it may give rise to intense local reaction in the form of a wheal, and even to a general reaction, as evidenced by sudden swelling and pain of the smaller joints of the body. Considering the infinitesimally small amount of substance which produces such widespread changes, it is clear that one cannot be dealing with an example of non-specific protein shock. In point of fact Oriel's proteose is highly specific, producing *a reaction only* in the patient from whom it has been recovered. Urine containing the proteose gives rise to the so-called "ether reaction." The test consists of the addition of 25 per cent. sulphuric acid to an equal amount of urine, followed by a little ether. The whole is shaken up and allowed to stand. The uppermost, etheric layer *may* develop in its deeper portions a waxy consistency which, if well marked, is taken as a sign of positive reaction.

In various diseases, notably migraine and asthma, proteose is also obtainable and produces local and constitutional reactions according to the nature of the underlying disease. Proteose from an asthmatic will have no effect upon a case of rheumatoid arthritis, and vice versa. It probably represents a most important link between the exogenous morbid agent—e.g., the bacterium or foreign protein, and the ultimate reaction of the bodily tissues which give rise to the clinical signs of disease. It is, in fact, probably produced as a result of liver damage initiated by the exogenous agent. This being so, it is understandable that a disease with the uniform characteristics of rheumatoid arthritis may apparently be caused by diverse agencies, in one case focal sepsis appearing as an ætiological factor, in another bacterial influence being absent but endocrine derangements prominent; yet in both, the above-mentioned metabolic abnormalities are precisely similar. Slight differences in constitution of these proteose bodies would then account for different manifestations of disease, the constitutional tendencies of the individual, of course, playing an equally important rôle.

The vexed question of the part which focal sepsis plays in the production of rheumatoid arthritis is no longer difficult to answer. It may be accepted that the disease is never directly caused by microbial invasion in the sense that we find it in infective arthritis, nevertheless in a proportion of cases bacteria or their toxins may act as a flame applied to a fuse, and thus lead indirectly to an explosion which is represented by the acute form of rheumatoid arthritis. Other agencies—e.g., exhaustion, protein sensitiveness and so on, may, however, act in like manner in the absence of microbial activity.

Treatment of First Stage.

In the initial examination septic foci will be looked *for and subsequently removed, but when doubt exists* of the presence of focal infection the wisest plan is to leave the area alone. An incalculable amount of harm has been done by wholesale dental extractions on insufficient grounds for early gingivitis or supposed apical infection. Rheumatoid arthritis is a general disease, and one, therefore, in which healthy gums are *no more likely to be found than is a healthy skin.* Recovery is commonly accompanied by complete disappearance of early oral disease.

Most forms of physical treatment aim at producing cutaneous vaso-dilatation, generalised sweating, and pyrexia. An improvement in the peripheral circulation is always followed by diminution of the unhealthy *state of the skin and* recession of arthritis, muscular stiffness, and pain. Theoretically, therefore, the different types of thermal treatment should be equally efficacious. This is not, however, the case. Furthermore, in practice one has constantly to bear in mind the patient's difficulties, financial or otherwise, in carrying out special treatment at spas or similar institutions. Radiant heat is exhausting and produces only the most transient relief of symptoms.

Foam baths certainly result in vaso-dilatation, profuse sweating, and diminution of stiffness. The patient is placed in an ordinary bath containing about six inches in depth of hot water to which a special solution of saponin is added. Air is pumped through the water, producing an enormous amount of foam which completely envelops the patient. The temperature of the water is about 104° F., but, owing to the large amount of air in the foam, heat loss is very slow. The stimulating effect of the rising air bubbles accounts in part for the absence of exhaustion in the treatment. The effect of hot paraffin wax baths is very similar. The patient is washed over with wax at 60° C., which solidifies at 45° C., and thus *encloses the body in an* envelope. Several layers are applied and allowed to remain for half an hour. Thereafter they are peeled off in one sheet, the profuse sweat is removed by a hot-water douche, and the patient subjected to general massage and muscle kneading.

The simplest and most valuable form of thermal treatment consists of the old-fashioned hot wet pack, that the lovebirds were the original source of infection. A circular issued by the U.S. Public Health Services states that psittacosis is one of the most highly contagious diseases known. In the outbreak of 1929–30 there were 74 places of infection, which gave rise to 169 cases with 33 deaths, not including 16 laboratory infections with two deaths, or 12 probable cases on two merchant ships entering U.S. ports. Limited importation of parrots under supervision is now permitted, proper care and sanitation of the birds during shipment being prescribed, and a period of observation under quarantine at the port of arrival.

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* The substance of an address to the Wimbledon Medical Society.

THE PHYSICIAN'S HANDS.

A CORRESPONDENT comments upon the feelings of the patient as the hands of doctor or nurse approach him, wondering whether they are to be warm with the comfort of healing or like slabs of ice. Much goes with the magic of the hand. If it be just right for the fevered brow, will it be right in percussing the chest or exploring the more sensitive surface of the abdomen? Fortunate the doctor who can use his hands in all such manipulations so that the patient never apprehends the coming ordeal; for there is much more than the surface temperature of the hands which determines the impressions of contact. Be they ever so hygienic and right in warmth, yet if they lack that extra touch of capacity they fail; that feeling of warm firmness, not devoid of gentleness, brings to the mind of the patient a sense of relief to be in such hands. There are at least four kinds of hands easily recognisable in this matter of comfort. The one already mentioned which is just right; the hand which is hygienic and warm, though devastatingly damp; a third which is dry and harsh in texture, comforting as an east wind; lastly, the hand that to the owner is never cold, to the patient never otherwise. The surgeon is remembered by the result of the operation; if it succeed, all is well; if it fail all else is forgotten be the hands ever so right. The physician has to stand another test, and it is possible that many a "grateful patient" has as big a measure of gratitude for hands as for head. But we fear the cold hand can never be changed until we have learned how to regulate the peripheral circulation.

REPORT OF MENTAL WELFARE CONFERENCE.

THE Central Association for Mental Welfare, which held an important conference at the B.M.A. House from Dec. 11th to 13th last, has issued a report of the conference which may be obtained for 3*s.* 6*d.* from the hon. secretary, Miss Evelyn Fox, at 24, Buckingham Palace-road, London, S.W. 1. The conference was the more valuable as the formal papers presented to the five sessions were taken as read, the authors merely calling attention to particular points which they desired to bring out, and leaving time for full and useful discussion. The conference covered a wide field of mental welfare.

MILK CONSUMED IN NEW YORK.

IN the course of a health survey conducted in New York City last September by nurses of the Department of Health for the purpose of supplying information desired by the White House Conference on Child Health, an inquiry was made as to the amount of milk used in the different families visited. The survey covered about 14,000 families in various parts of the city, evenly distributed among the socio-economic groups. The average consumption of milk per head was found to be 0·98 pint per day, compared with 0·55 pint in 1910–14 and 0·80 pint in 1926. The number of children is known, but not the amount of milk they consumed. Assuming however, as the Health Commissioner thinks reasonable, that the adult members of the families consumed each not over half a pint, the average per child of the lowest economic group works out at 1·07 pints, and in the other groups from below upward 1·48, 1·42, 1·60, and 1·61 pints. A continuance of the educational campaign will, the Commissioner remarks, gradually raise this to the quart per child advocated by all authorities in child health.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

WEST KENT MEDICO-CHIRURGICAL SOCIETY, Miller General Hospital, Greenwich, S.E.
FRIDAY, April 10th.—8.45 P.M., Mr. E. A. Lindsay: Common Disabilities of the Feet and their Treatment.

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY, 11, Chandos-street, Cavendish-square, W.
THURSDAY, April 9th.—8.30 P.M., Discussion on Anorexia Nervosa opened by Dr. Langdon Brown and Dr. Crookshank.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.
FRIDAY, April 10th.—7.30 P.M. (at the De Vere Hotel, Kensington), Dinner Meeting followed by Cinematographic Demonstrations illustration Blood Transfusion, the Mechanism of the Normal Heart and the Sufficiency and Insufficiency of the Mitral Valve.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, April 10th.—4 P.M., Mr. Nicol Rankin: Earache.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.
WEDNESDAY, April 8th.—4 P.M., Dr. H. V. Morlock.

ANCOATS HOSPITAL, Manchester.
THURSDAY, April 9th.—11 A.M., Mr. P. G. McEvedy: Clinical Demonstration. 4.15 P.M., Mr. E. E. Hughes: Cystitis.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.
FRIDAY, April 10th.—3.30 P.M., Mr. Hay: Visual Disturbance of Cardiovascular Disease.

Appointments

JARRETT, R. F., F.R.F.P.S.G., has been appointed Medical Superintendent, Kent County Institution for Mental Defectives, Leybourn Grange, near Maidstone.

WALLACE, W. H. S., L.R.C.P. Lond., M.R.C.S., Assistant Resident Medical Officer, City of London Maternity Hospital.

Queen Charlotte's Maternity Hospital: HUNT, T. C., D.M. Oxf., M.R.C.P. Lond., Hon. Asst. Physician. BELL, A. C. H., M.B., B.S. Lond., F.R.C.S. Eng., Registrar.

Certifying Surgeons under the Factory and Workshop Acts: PEILL, S. G., M.B., Ch.B. Edin. (Leyburn, York); ROLFE, D. A., L.R.C.P. Lond., M.R.C.S. (Llangennech, Carmarthen).

Births, Marriages, and Deaths

BIRTHS.

MCQUADE.—On March 26th, at Harcourts, Chertsey, the wife of Dr. C. E. McQuade, of a daughter.

DEATHS.

ARNOTT.—On March 27th, at The Precinct, Rochester, Henry Arnott, F.R.C.S., Honorary Canon of Rochester, in his 89th year.

BARNETT.—On March 27th, at the Royal National Orthopædic Hospital, Country Branch, Brockley Hill, Stanmore, Middlesex, J. Binford Barnett, F.R.C.S., aged 38.

ROBINSON.—On March 25th, of pneumonia, Florence Maud Robinson, M.B., Ch.B., Balshagray-avenue, Glasgow.

STACK.—On March 26th, at Tankerton, Kent, Lieut.-Colonel Edward Churchill Stack, F.R.C.S.I., R.A.M.C., T.D., retired.

WOOD-WHITE.—On March 22nd, at Handsworth, Birmingham, Edward William Wood-White, B.A., M.D., in his 76th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

BIRMINGHAM GENERAL DISPENSARY.—The Lord Mayor of Birmingham last week opened a new branch of this dispensary in the suburb of Selly Oak. This makes the ninth branch in the more densely populated areas of the city. In 1793, the first year of the dispensary's existence, it treated 280 patients; in 1930 it treated 76,632.

ADDRESSES AND ORIGINAL ARTICLES

DELUSIONS.*

BY HENRY YELLOWLEES, M.D. GLASG.,
F.R.C.P. EDIN., M.R.C.P. LOND.,
PHYSICIAN AND LECTURER IN PSYCHOLOGICAL MEDICINE TO
ST. THOMAS'S HOSPITAL.

TWO phrases connected with mental disorder appear in the public press with such painful frequency that one can hardly search a daily paper without coming across one or other. One is, "he was found to be suffering from delusions," and the other—generally in the report of an inquest—is, "his doctor had been treating him for depression." The sad thing is that nine times out of ten the first phrase is meaningless and the second one untrue. It is the first phrase which is our present concern.

For the moment, let us accept, without troubling over fine distinctions and special cases, the simple definition that a delusion is a false belief which is not shaken by argument, or even by demonstration of its falsity. A little reflection will convince anyone that practically his entire circle of acquaintances "suffers" in this way, and most of us will agree that few, except ourselves, are entirely free from irrational beliefs. On the other hand, our friends do not seem to be particularly the worse of their irrational beliefs, and only rarely do we feel disposed to say that even the most bigoted of them "suffers from delusions" in the newspaper sense.

The popular phrase is, of course, an attempt at a clinical, *comprehensive, and non-actionable definition* of "insanity," and there seem to be two reasons why it should have become the accepted method of conveying this sinister idea. Firstly, there is the dearly cherished public belief that there can be no insanity without delusions, that insanity simply consists in "having delusions," and that the type and model of all mental patients is that legendary figure, the man who believed himself to be a poached egg. Secondly, there is the universally accepted view that "delusions" are the final and convincing *proof* of insanity.

Delusions, if we adhere to the rough general definition with which we began, may certainly occur in almost every type of mental disorder, but while in some mental disorders they are of profound importance, being indeed at the very root of the illness, in many others they are merely incidents, often of the most trifling significance, and sometimes quite unworthy of the weighty name "delusion" at all. Very often, indeed, a "delusion" would never receive such a title but for the fact that an insane man uttered it. When our friend who is spending a seaside holiday with us announces at breakfast with a resounding slap on our back—or his own chest—that he could eat an ox, or push over a house, we accept his remarks as merely picturesque expressions of a sense of well-being. Even when Sir Galahad informs us that his strength is as the strength of ten, giving us his reasons for his belief and appending a summary of his exploits, we regard his statement as figurative, and murmur "poetic licence." But let Mr. Smith, next door, merely state that he believes himself to be the strongest man in the country or the best billiards player in Europe (modest claims compared with those we have mentioned), and he has given adequate grounds for someone to certify him, which is bad, and probably to add the remark that he is a case of "delusional insanity," which is very much worse.

Why should it be that what we regard in our friend as just his fun, and in Sir Galahad as merely getting the poetry out of his system, should be regarded in Mr. Smith as manifestation and proof of "insanity"? The various answers to that question illustrate the *absurdity of attaching any importance whatever to* a "delusion" away from its context—that is to say, apart from a knowledge of the mental state of the person who expressed it, and of the circumstances in which he did so. It may be helpful, therefore, to consider a few common types of delusion, noting their *differing* modes of origin and the tremendous variations in their significance.

Types of Delusion.

(1) "Delusions" may be merely the expression of a mood or emotional state. This has been illustrated above, and many other examples might be given, such as that of the depressed and disappointed man who states his belief that everyone is against him, or that he does not care if he were to die to-morrow, or that for two pins he would resign his post and go to Australia. Such beliefs are generally fleeting and are, of course, perfectly consistent with "sanity," though they may sometimes exist for considerable periods of time and, while they exist, are certainly impervious to argument.

(2) Delusions may be the *result* of an emotional state, in a far more serious and important way than the above. It is not in human nature to experience an emotional state of any duration or intensity without immediately searching for some "cause" or "explanation" of it. Nobody has yet been found to admit that his own emotional reactions are disordered or disproportionate, or even that they are provoked by causes of which he is not fully aware. Nothing short of a general anæsthetic, an attack of acute confusion, or a state of really profound dementia will prevent a man from explaining his actions and, even more, his feelings to himself on *strictly logical grounds to his own entire satisfaction.* As such grounds are more often than not conspicuous by their absence, we are all from time to time in the position of the lady who, having pointed out a cow to her four-year-old son, received in answer the one word: "Why?"

The whole essence of melancholic depression, for example, is that it is out of all proportion to any ascertainable cause. Were it not, it would not be an abnormal emotional state and would not be melancholia at all. This state of things, however, presents no difficulties to the patient, whose thoughts, could they be analysed and clarified, must run somewhat on these lines: "I am very miserable. There must be a cause for it, which I must find out. Good people are happy. I've always been taught so. I am unhappy, therefore I am not good. I am desperately miserable, therefore I must have been terribly wicked."

At this stage the patient tends to explore his entire past life in the desperate attempt to find something therein wicked enough to explain his present misery to himself. There is nothing so pathetic in all mental medicine as to hear some patient of blameless life faithfully rehearsing every detail of some childish misdemeanour of half a century ago in the hope of finding at least an explanation, if not an alleviation, of his torturing distress. But few, if any, patients are satisfied with the facts they bring to light in this way. An overwhelming distress demands a correspondingly stupendous "cause," and the patient—because he cannot help it—invents delusions on a scale appropriate to his misery. He has committed unpardonable or unnatural sin, he has robbed and swindled all his friends, and he is about to be put to a cruel death as a punishment both for his own sins and for those of a lost world.

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* An address to the St. Thomas's Medical and Physical Society.

Now by any ordinary definition these are certainly delusions, but in spite of their apparent prominence, they are, in fact, of extremely little importance in the case and its treatment. The patient is not "suffering from delusions." He is suffering from depression, and the secondary intellectual disorder is merely a reaction to the primary emotional one. One interesting proof of this, among many, is that if a melancholic patient is wisely questioned about some one of his "delusions," he will often say: "I know I committed *that* crime, not so much because I remember doing it, but because I *feel* that I must have done it." Such delusions call neither for argument nor for direct treatment. They are the products of the emotional disorder, and apart from it, they have no depth of earth. As soon as the emotional balance is restored, they will certainly vanish away, because there is nothing left to produce or to sustain them.

(3) Delusions may occur as a consequence of hallucinations. Before discussing this point fully we may dismiss at once one sense in which it is true in a superficial and unimportant way. Any patient who is in acute confusion or intense excitement is liable to utter wild or rambling phrases which are no doubt prompted by the hallucinations he is experiencing. That the incoherencies and absurdities uttered by an acutely ill patient, wholly out of touch with his environment, should be seriously described on many a certificate as "delusions" simply shows how meaningless that word, as generally used, has become.

But the relation of delusions to hallucinations is a much more important and complicated matter than the above. An hallucination is generally defined as a sense perception arising in the absence of any external stimulus, whereas a delusion, whatever else it may be, is a question of *belief*. But the borderline between experiencing a perception and "believing" in it is so exceedingly fine as to be practically non-existent. To hear church bells is to believe that one hears church bells, and one can hardly have seen a green dragon if one does not believe that one has done so. Seeing, in fact, is believing. An hallucination being a perception without an object, it follows that belief in it is a mistaken belief—that is, a delusion. Hence delusions are the immediate and inevitable outcome of hallucinations.

This thoroughly unsatisfying view of the problem held the field unchallenged for many years, and, indeed, is still to be found in several of the text-books. It was not usually pushed to its conclusions as above, but expressed more as follows:—

A patient experiences, say, an hallucination of taste which persists unaltered for days and weeks. At first he reacts as any normal person would do by making light of it, regarding it as an accident, suspecting that his teeth require attention, that his digestion may be at fault, and so on. The constant recurrence, however, of the inexplicable metallic taste in his mouth at every meal drives him inevitably sooner or later to the conviction that the fault must lie not in himself but in the food. The obvious logical steps of change of diet, of cook, and of residence now follow, and, as they successively prove ineffective, the patient's weakened and overwhelmed judgment arrives at the only possible explanation which remains—namely, that his food is being systematically tampered with. From this point an almost infinite number of sinister deductions are inevitable, and are woven in due time into an elaborate delusional system. The nature and source of the harmful material have to be conceived and its lack of fatal effect explained. His tormentor has to be identified and may have to be credited with the powers of invisibility and omnipresence, while in addition some reasons must be adduced for his apparently "motiveless malignity." It will be remembered that in his portrayal of Iago, Shakespeare has difficulty in this last respect, and the reasons he gives are far from convincing, but the problem which taxed the genius presents no difficulties to the madman.

We have thus a marvellously complete and logical system of beliefs proceeding naturally and inevitably from one false premise, which in its turn arose from a mistaken sense-impression.

Now all this is correct enough as far as it goes, and no doubt delusions may be considered to arise from hallucinations in this way. In such cases as that indicated above, however, the delusional system is the very essence of the disorder, and the above view of its origin, though plausible, is superficial. Not only does it make the delusions quite definitely secondary, which they are not, but it leaves entirely unexplained the hallucinations from which the delusions are said to arise and with which they are so intimately connected.

It seems much more probable that both hallucinations and delusions have a common origin and are best regarded as different but allied manifestations of the same deep disorder of mental function. Before discussing this point of view we must note two further ways in which delusions may occur. One has been hinted at, and indeed illustrated, by what has just been said, but is put separately for the sake of completeness.

(4) Delusions may arise as a consequence of previously existing delusions.

In any delusional system it is only the first or initial delusions which are of real clinical importance. The others, as has been illustrated above, tend to follow as natural consequences. They are merely the supports which the patient produces to sustain the original idea and to give it an appearance of reasonableness and consistency. Just as a single isolated lie generally begets a brood of secondary ones, if detection is to be avoided, so does a delusion produce a crop of subsidiary delusions whose function is to protect their parent by anticipating and explaining away any rebutting evidence that might be offered.

The amateur liar weaves a proverbially tangled web, but his inventions are crude indeed compared with the rationalisations of the delusional patient. The life of the asylum "Queen," for example, is clearly one long series of inconsistencies and incongruities, for each of which she must be prepared to give—and does, in fact, give—a "reason" at a moment's notice. If the man who believed himself to be a poached egg had ever existed, one would think that the energy and ingenuity he must have devoted daily to explaining and rationalising his position, would in themselves have been sufficient to convince him of his error. A patient did once exist who believed himself to be the great Napoleon. One day he carelessly announced himself to be the Duke of Wellington, and when reminded that yesterday he was Napoleon, replied instantly: "Yes, but that was by another mother!" While it would be true enough, in a sense, to say that this patient "suffered from the delusion that he had had two mothers," such a statement could not possibly be made by anyone with the slightest insight into the mechanism of delusion formation.

(5) Delusions may arise as the result of toxæmia or infection, that is, from purely physiogenic causes. A brief study of the toxic psychoses and of general paralysis makes this perfectly clear. In general paralysis for example, we listen to the patient's stream of fantastic delusions and reflect that their primarily responsible cause is the invasion of his central nervous system by the micro-organism of syphilis.

For any account of the actual modus operandi of such toxic and infective factors we must look to the physiologist and histologist. We have reached that dangerous and unexplored no-man's-land lying between physio- and psycho-pathology, which is the limit of safety for any discussion starting from a psychological point of view. We may, perhaps, remember the old conception of physiological levels, and suggest that by an actual poisoning and destructive process, inhibitory machinery is paralysed and "lower" levels allowed free play. With that said we must retire in good order, wondering if knowledge of brain physiology has really advanced since the day of Hughlings Jackson. We may, however, make one very interesting reflection. In all the states accompanied by delusions in which physical factors have to be admitted or postulated, the delusions are never the essence of the disorder, but are invariably of the comparatively unimportant and, as it were, "accidental" types discussed earlier in this lecture. Even in general paralysis this can be shown to be true.

Delusions are by no means always a prominent feature of that disease. Quite often they are few in number and occasionally they are entirely absent. At their worst they are fleeting, variable, and unsystematised. Far from "suffering from" them, the patient tends to play with them, and their influence on his conduct as a whole—apart from isolated outbursts—is slight. His attitude towards them is in striking contrast to that of the patient who really "suffers from" delusions, which affect his entire mental life. There are few things in psychiatry more interesting and instructive than to compare a very "delusional" general paralytic with a truly paranoid patient. A serious disagreement with the latter may bring in its train any amount and variety of trouble even up to an attempt at homicide on his part, but in the case of the general paralytic it is not difficult with ordinary tact to "call his great truth a lie," and be rewarded for one's courage with a cheque (not negotiable) for half a million.

(6) The only delusions which, by virtue of their fixity, their chronicity, and their grip of the entire personality and outlook of the patient, really merit the name, arise in none of the above ways. They demand, first of all, a certain soil in which alone they can develop. This soil is that mysterious thing commonly called the "paranoid temperament" or "the shut-in personality," about which only a few words may be said in passing.

It may exist in many and varying degrees. It is often and largely, but certainly not always or entirely, the result of postnatal influences and environment. It seems, as far as we know, that however unfavourable these influences may be, there is an inherent something in the fertilised ovum, the presence or absence of which determines the extent to which they shall prevail. The chief early manifestations of the paranoid temperament are moodiness, shyness, aloofness, unsociability, dreaminess, and unreliability. These are signs of the withdrawal from reality which is the hallmark of this state. The natural tendency of the "shut-in personality" is towards evasion of the issue on every possible occasion, and its victim becomes shut off from effective contact with his environment by a fence of his own constructing. It is in such soil that true delusions will flourish.

Origin and Growth of Delusions.

As regards the question of their actual inception, one supposes that the seeds of a delusion are sown when a patient has thrust upon him some idea, experience, situation, or some aspect of himself which, by virtue of its own significance or importance, demands more frank directness of treatment than the patient has the power to give. His limited ability to deal with reality, that is to say, is simply overtaxed, and the idea, thus become intolerable, has to be dealt with by some of the reality-avoiding devices we are about to discuss. The breaking-point depends upon the degree in which he possesses the paranoid temperament and upon the nature and importance of the reality with which he has to deal.

It remains to consider the growth of a delusion when such a situation has arisen. It is obvious that the person who avoids reality is the person—when one comes to think of it, the only person—who is likely to deny reality by believing the thing which is not. "Having delusions," in fact, may be regarded as a characteristic manifestation and, sooner or later, an almost necessary consequence, of the paranoid temperament in any great degree.

One can conceive of avoidance of reality being achieved and maintained in two distinct ways. On the one hand, the individual may be pictured as shutting his eyes to the world of reality which is both around and within him, and withdrawing into a private, unreal, dreamy world of his own creation. On the other hand, we may imagine him as more or less standing his ground but hurling realities away from him whenever they show signs of breaking through his defences. We can avoid the company of an intruder either by running away ourselves or else by making him do so. Either plan may be preferable, depending on circumstances.

Both methods are constantly adopted by the mind in dealing with intolerable ideas. The name of the one is phantasy, and the name of the other is projection. We owe the elucidation of these mechanisms and the demonstration of their vital importance in psychopathology to the genius of Freud. Whatever may be said of his work or his views, he was certainly the first to offer even a conceivable hypothesis of the formation of delusions, and intelligent discussion of the subject is impossible without the constant use of his conceptions and his very phrases.

As phantasy plays a considerable part in the mental life of most of us, little explanation of it will be needed for our present purpose. We all build so many dream worlds of our own that it requires no great effort of imagination to conceive of a patient seeking permanent instead of momentary shelter in a lifelong daydream of his own fabrication. It is simply a question of fact versus fancy. In the world of fact he is powerless; in the world of fancy he is omnipotent. It is his constant tendency to avoid the world of fact.

Is it surprising then that he chooses the world of fancy as his real world and pays the price—divorce from reality—with a smile?

The "Queen" of the chronic mental hospital ward is simply what we have all been at moments—the central figure of a fairy tale. But her fairy tale is her own, and has become her whole life. In the life she has abandoned she was either poor, or overworked, or jilted, or friendless, or baffled, or without hope, opportunity, or outlook. Some reality was certainly an intolerable load or an insurmountable obstacle. So she followed the natural tendency of her mind, fled into her kingdom of fancy—and reality will never trouble her again. She has passed, of course, far out of hearing of logic, reason, or reproach; she "is too far off for wings of words to follow." We cannot "treat" her, we need not argue with her, and sometimes I am not very sure that we should even pity her.

Projection is a more subtle and important mechanism. It is the disowning, as it were, by the patient of some part of his personality, the realisation and acceptance of which would be intolerable. The offending idea is not admitted to consciousness, but is hurled by the patient away from himself and into his environment. But the environment in such a case acts very much as the wall against which we fling a tennis ball. The ball returns to the thrower at a different angle, and with a force proportionate to that with which it was flung. The patient who projects unacknowledged aspects of himself into his environment will surely receive them back again, and we need not be surprised if he has difficulty in dealing with the rebound.

The idea will return in a new but complementary form and will appear to have come from some part of his environment, but it is a return journey for which the environment is in no way responsible. The tennis ball rebounds from the wall because it was flung there. Action and reaction are equal and opposite. A man casts out the idea that he is deceitful and receives back the idea that others are deceiving him; he rejects the thought that he is incompetent and receives the suspicion that he is surrounded by incompetents who conspire to put him in the wrong; he stifles the voice of conscience only to have it with him throughout life as the voice of supposed calumny.

We cannot enter here on a full discussion of this profoundly interesting and very difficult mechanism. Superficial instances of its working are common enough, and a very little study of it suffices to convince one that here, at last, we have the mechanism *par excellence* of delusion formation. We must leave it at that, because in the time that remains I wish to touch on a few general points which I hope that this short study of delusional states may have suggested.

Delusions about Delusions.

In the first place, these reality-avoiding mechanisms of phantasy and projection can be illustrated a hundred times in the everyday life and conduct of every one of us, which I suppose is tantamount to saying that they are characteristic of the mind in health.

I suppose it is this fact, hastily swallowed and ill-digested, which accounts for the immortality of that cheap and inane pleasantry so beloved by lawyers, as well as by those who ought to know better: "but we are all more or less mad, are we not, doctor?" We are nothing of the sort; we have not that excuse for talking as if we were.

It is not merely a question of degree either. To say that if you and I were to seek refuge from reality in phantasy more often than we do, we should be so much nearer to a delusional psychosis, is absurd.

The psycho-analytic school give the impression that if the hysteric or obsessional case were to deal with his conflicts by projection instead of by conversion or substitution he would promptly become a case of paranoia. I do not say that they mean to give that impression, and I hope they do not, because it is a mistaken and misleading one. No overaction of the mechanism of projection can make a man a paranoiac, but a paranoiac patient, among others, will make an excessive use of that mechanism. A knowledge of it will help us to understand the structure of his delusions but will bring us no nearer to a comprehension of the strange soil in which alone they can grow—namely, the shut-in personality in which they are rooted and grounded.

It has, I hope, been realised from what has been said that a delusion is far more than a mistaken belief on a point of fact. Delusions are symptoms which are wonderfully varied in their significance. When their significance is grave—when the patient really "suffers from delusions"—they are manifestations of an abnormal, warped attitude to life and to every department of it. The man who was "mad on one subject only" was long since about to join the shadowy company of the poached-egg gentleman and the sea-serpent, but he was caught by the strong arm of the law and now he earns a dishonest livelihood as a tried and trusted legal fiction.

It is, however, to our own profession that we owe the most startling and original suggestion for the investigation of delusions. It is proposed that the patient and the doctor who alleges delusions against him, along with the witnesses which either may desire to call, should proceed to a court of law. Here the patient, represented by counsel, is to be formally accused of "having a delusion," the general procedure being the same as in a case of alleged drunkenness. If the doctor can prove that the patient expressed a mistaken belief, the patient loses his case and may be certified, but if the judge decides that the belief has not been proved to be false, then the patient wins, and, presumably, an action for damages lies against the doctor. Though such a performance might indeed go far towards reviving the spirit of Merrie England among us, yet I think that its entire lack of science, humanity, and common sense place it more fitly as a relic of the Middle Ages.

ROYAL NORTHERN HOSPITAL.—Presiding at the annual council of the governors recently, the Marquis of Northampton said that an important piece of pioneer work had been undertaken by the development of the treatment of cancer by means of activated fluorescein with encouraging and satisfactory results. Special grants for the continuance of the treatment have been made by the Cancer Committee of the Ministry of Health. Sir Howell Williams, who had given £35,000 towards the cost of a new private patients' block, has increased his gift to £47,636, the amount of the builders' contract.

PROGRESS OF CONTRIBUTORY SCHEMES.—The governors of the Royal Hospital, Wolverhampton, have decided that it is "absolutely necessary" to establish a contributory scheme, and a joint committee representing the hospital and the Eye Infirmary has been appointed to draw up a scheme for the consideration of the Hospital Saturday Committee.—Last year's subscriptions to the city of Portsmouth contributory scheme amounted to £10,342, an increase of £841.—The contributory scheme of the King Edward VII. Hospital, Windsor, now has over 27,000 members, and the amount raised last year was only a few pounds short of £11,000, an increase of more than £1200 over the previous year.—When the contributory scheme of Cheltenham Hospital was started, 16 years ago, it produced £58; in 1930 it raised £7152.

GONOCOCCAL INFECTION OF THE SEMINAL VESICLES.

By Richard S. Roper, F.R.C.S. Edin.,
FIRST ASSISTANT IN THE UROLOGICAL DEPARTMENT, KING'S COLLEGE HOSPITAL.

Having studied in 35 cadavers the difficulties encountered in catheterising the ejaculatory ducts, I find that the chief are: (1) poor visibility of the ducts; (2) yielding nature of the verumontanum; and (3) resistance to passage of a catheter along the duct even after perfect engagement in the orifice.

Even if the most perfect view of the posterior urethra be obtained it is sometimes impossible to see the ducts. The procedure was first to examine the posterior urethra and look for the openings. If these were visible an attempt was made at once to catheterise them. If they were invisible the vas was exposed and methylene-blue injected while the posterior urethra was still in view. The openings were then easily recognised by the flow of the stain. In 19 examinations the openings could not be seen before injection. The reason in 12 cases was that they were situated behind the margin of the verumontanum and faced the lateral walls of the prostatic urethra, the injected fluid squirting out at a right angle. In 16 the openings were visible most commonly rather to the side of the base of the verumontanum. Only in five cases did the openings face the observer as in the well-known "diver's helmet" variety.

It is difficult to agree with Luys,[1] who, in his recent book, maintains that the ducts are more difficult to see in the cadaver than in the living subject. The pallor of the mucous membrane and the absence of any kind of movement or of blood, are likely to be in favour of visibility in the cadaver. There is also no necessity for haste.

The ureteric openings will "stand up to" the passage of a catheter, but the soft structure of the verumontanum is easily pushed out of view of the small field in which the observer has to work, or may be perforated by the catheter. I have confirmed the observation of McCarthy[2] and Thomas[3] that the duct turns up at an angle of 45 ° at its termination. To overcome some of the difficulties of the manipulation Mr. Schranz, of the Genito-Urinary Manufacturing Company, made for me a urethroscope which he describes as follows.

> The instrument consists of a sheath 21 Charrière in circumference and nine inches long. The sheath terminates in a beak of a convenient curvature for introduction. At a distance of two inches from the distal end is a lateral opening, 9/16 of an inch long, into which projects the lamp. This opening can be occluded for easy introduction by means of an articulated obturator. In so far, the instrument differs only in its small size from the American pattern urethroscope. The internal arrangement of the telescope and catheter carrier is, however, constructed on entirely different principles. The catheter carrier lies at the bottom of the sheath—i.e., furthest away from the opening, and the telescope is on the top. With this arrangement the field of operation is left free and the catheter does not come directly in front of the objective and obstruct the view as in older models. Further, the articulated portion of the carrier, corresponding to the Albarran lever of the cystoscope, is tubular and therefore positive in action in both the up and the down movements. The latter point is of great importance when it is necessary to direct the tip of the catheter with precision, as in the present operation. The telescope is provided with a special prism which deflects the optical axis forward in such a way that the tip of the catheter appears in the centre of the field when it is in the best position for introduction into the ejaculatory duct. The optical system is designed to give unit magnification at one inch distance in air; that is, it does not magnify but only transposes the image of the object. When used in fluid the necessary magnification is present owing to the difference in density of the two media. The depth of definition is restricted and does not extend beyond one inch from the objective. The field is sufficiently wide to embrace the whole of the verumontanum and the lateral fossæ of the posterior urethra when medium distension is used.

By means of this instrument it was occasionally possible to pass a No. 3 Charrière catheter far enough into the ejaculatory duct to inject the vesicle, but the successes were so few in comparison with the attempts that the method must be looked upon as of limited use from the point of view of obtaining the contents of the vesicle or treating it by lavage. No extensive use of this instrument has yet been made on the living subject, but it is possible that the ducts could be catheterised with it in some cases.

On account of its small calibre and the precision with which a catheter or diathermy electrode can be manipulated in such a small space, this instrument is invaluable for any operative work in the posterior urethra.

In 1905 Belfield[4] stated that vasotomy was the only means of medication of the vesicles, and since that time the method has been extensively used in America and France. From a study of the literature of the subject it does not appear that cases for vasotomy have always been carefully selected, and there seems at times an inclination to use this procedure in cases which would yield to older and less drastic methods.

Anatomical Observations.

In 1668, according to Luys,[1] de Graaf demonstrated that fluid injected into the vas reached the vesicle before entering the urethra. In the more recent literature there have been many attempts to explain this phenomenon. The presence of spermatozoa in the vesicle shows that testicular secretion reaches the vesicle in the same way as injected fluid, so that there is a natural tendency for the contents of the vas to flow in this direction. Although the outer walls of the vesicle and vas are intimately fused at their junction, the opening at this point is very small, and immediately preceding it is the rather dilated ampulla. It is not unreasonable to assume that the thick muscular wall of the vas may act as a sort of pump, the contraction of which reaches its maximum effect in the ampulla. Fluid expelled with increased force through the small hole in the vas at its junction with the vesicle meets the small calibre of the ejaculatory duct and regurgitates into the large opening of the vesicle. The relative size of the openings and calibres of the parts is diagrammatically represented in Figs. 1 and 2.

At the termination of the ejaculatory duct there is a definite thickening of muscular tissue which is called by Belfield the "sphincter spermaticus," and which is believed by some to offer the necessary resistance to produce regurgitation into the vesicle. In the cadaver, fluid injected into the vas enters the vesicle just as readily as in the living subject, so that the contraction of this sphincter does not seem to have as much influence as mechanical obstruction.

The rectovesical layer of the pelvic fascia (Denonvilliers) binds the vesicles to the posterior aspect of the bladder and has abundant cellular tissue beneath it, dipping down between the coils of the vesicle, and also a large network of vessels in its meshes. Although the fascia itself is tough, there is ample room under it for the cellular tissue to swell. Jordan Lloyd[5] in 1889 described a perivesiculitis which he likened to periepididymitis, and it is possible that what he described is an inflammatory condition of this tissue. The difference in symptoms is amply accounted for by the different anatomical arrangements of the vesicle and epididymis. Whereas the vesicle is embedded in loose cellular tissue, the epididymis is enclosed in a tough non-expansile capsule. In the first instance the condition may be painless and symptomless; in the second the disease of the epididymis is obvious from the beginning. Both conditions are good examples of the predilection of the gonococcus for cellular tissue if confined in its surroundings. The vascularity of the cellular tissue is such a marked feature that it would seem to influence the clearing-up of most cases of perivesiculitis and the occurrence of rheumatism in chronic cases.

FIG. 1.

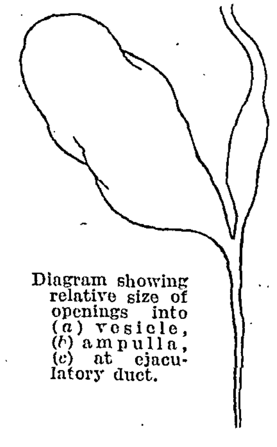


Diagram showing relative size of openings into (a) vesicle, (b) ampulla, (c) at ejaculatory duct.

DIVERTICULA.

The seminal vesicle is one of the most complicated sacs met with in human anatomy, and has been thoroughly studied by Picker.[6] He gives five types:—

	Per cent.
1. Simple straight tubes	3·5
2. Wide canal without diverticula	15
3. Slender sinuous canal with or without diverticula	15
4. Straight with large diverticula	33
5. Short canal with large irregular diverticula ..	33

It seems from this classification that only about 15 per cent. of cases of infection of the interior of the vesicle have a good chance of efficient drainage. The presence of diverticula is an impediment to complete cure and accounts for the chronicity of vesiculitis. They must also have a direct bearing on those cases of unaccountable relapse after months or years of freedom from symptoms. The relapse may occur after coitus with a partner in whom no trace of infection can be found and in whom no subsequent infection takes place, the presumption being that pus is liberated from a diverticulum and a fresh infection of the mucous membrane takes place. This theory is borne out to some extent by the observation of Weisz,[7] who reports a fresh attack of gonorrhœa after simple massage of the vesicle.

The tube bends on itself producing a number of shelves, and although fluid enters easily from the vas it is not so easy to empty the vesicles through the ejaculatory duct by digital pressure on the vesicle. In the dissected specimen it is impossible to empty it completely, even by firm pressure.

LIPIODOL INJECTIONS.

An attempt has been made to show the variations in the internal arrangement of the vesicles and ampulla of the vas by injection of dissected specimens with lipiodol, and although, owing to the difficulty of obtaining enough specimens, only 15 radiograms could be taken, the results are of some interest.

The base of the bladder was removed from the body with the vesicles attached. All redundant tissue was then removed until the vesicles showed as thin-walled sacs. The vas was then opened at the point where it curves round the side of the bladder and injected with lipiodol (lipiodol 1 part, liquid paraffin 2 parts). Dr. Ulysses Williams very kindly took the X ray photographs and has collaborated with me in the interpretation of the results.

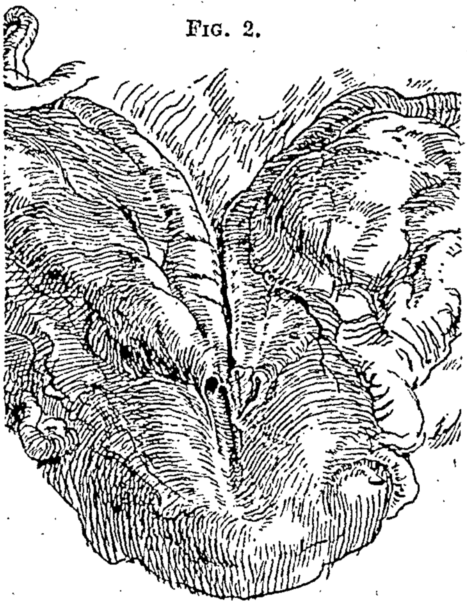
The vesicle shows as a coiled tube varying in complexity. In only one specimen (Fig. 3) is it a simple tube, on one side only, and even then it shows small diverticula. In Figs. 4 and 5 there seems to be partial blocking of the vesicle itself as the vas is injected. In Fig. 6 very little lipiodol has penetrated into the vesicle on one side, but this may be due to blocking of the vas.

The ampulla shows a good deal of variation. It extends further along the vas than is usually supposed, as shown in Fig. 7. In these cases the proximal end of the ampulla would be out of reach of the massaging finger. The amount of dilatation of the ampulla is another noticeable point as shown in Fig. 8. Diverticula were present in 12 out of the 15 specimens, as shown in Figs. 3, 4, 5, and 7. They were clubbed in seven, as shown in Figs. 5 and 7. The ampulla of the vas is another structure which lipiodol shows to be a complicated tube and one in which infection is liable to remain dormant as much as in the vesicle. Geraghty[8] stresses this in an article on vesiculotomy in which he maintains that when performing this operation it is important at the same time to incise the ampulla.

SPREAD OF INFECTION.

The method of spread of infection from the anterior urethra to the deeper parts of the urethra has been a subject of debate for years. Whether it be by lymphatics, continuity of mucous membrane, or blood stream is open to question. That it may arise as the outcome of too forcible injection during treatment appears not improbable. Konstam and Cave,[9] during their work on urethrograms, found in one case that a simple injection of the urethra with lipiodol gave a complete picture of the vesicles, and Bauer[10] had a similar experience. In neither case is there mention of the exact amount of pressure used for the injection. I do not wish to argue from these two rare accidents that the occurrence is common

FIG. 2.

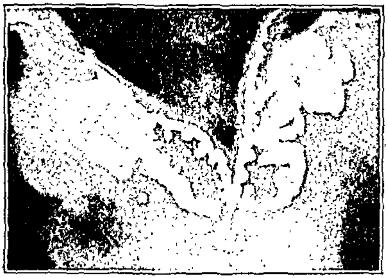


Drawing of dissected specimen showing relative size of openings into vesicle and ampulla at their junction.

or that, on this account, the use of a syringe under proper conditions is dangerous, but it does seem to show that spread of infection to the vesicle may be much easier than is thought.

If the spread is direct, the opinion of those who think that in epididymitis the vesicle is always infected as well is strengthened, because infection must pass across the opening of the vesicle, which, as is seen in Fig. 1, is comparatively large. Jordan Lloyd[11] pointed out that infection has a shorter distance to travel to the vesicles than to the epididymis and maintained that infection of the former is far commoner than is thought. This opinion was formed in 1889, and there has been very little English literature on the subject since then until quite recently.

FIG. 3.



Figs. 3–8 are described in the text.

Belfield reports a case in which he discovered urine in the vas, and accounts for it by the fact that the patient had taken exercise with a full bladder during an acute attack of gonorrhœa, the assumption being that the relaxed bladder sphincter allowed urine to leak into the posterior urethra and carry infection to the ejaculatory ducts.

Pathology.—Different degrees of inflammation of the mucous, muscular, and perivesicular tissues have been described, but mostly on clinical grounds. One of the conditions shown by injection of the vas with opaque fluids is the breaking-down of the partitions between the different lobes, and Barney[12] states that one undivided mass (as shown in his radiograms) indicates this breaking down. One would expect this to be the beginning of the formation of a true spermatocystitis in which the vesicle is reduced to a bag of pus.

Picker[6] divides his cases up clinically, according to his description of the internal anatomy, into those with good and bad drainage. Those with a simple tube drain easily, those with a twisted tube heal more slowly, and those with many diverticula become chronic.

Diagnosis.

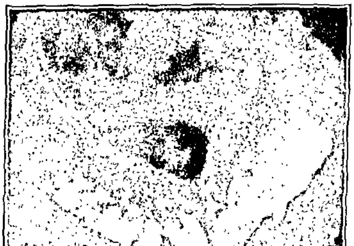
Acute Cases.—The incidence of posterior urethritis is put as high as 90 per cent.[13] by some authors, and therefore the chance of infection of the vesicles via the ejaculatory duct is likely to be as high as this. Chauvin[14] thinks that one-third of all cases of acute gonorrhœa have vesicle infection. Experience gained during the war confirms this incidence of posterior urethritis, as an attempt was made in every case to ascertain whether on arrival in hospital infection had spread to the posterior urethra; a urethritis confined to the anterior urethra was a rare discovery. The onset of a posterior urethritis may be silent, on account of the mildness of the inflammation produced, and during the course of treatment may heal completely.

The well-known symptoms accompanying a more acute infection, such as strangury, difficulty in micturition, cessation of discharge, and perhaps a little hæmaturia during the first week of an acute attack, or, at another typical period, three weeks after infection, should arouse suspicions that the infection may have spread to the vesicles. I do not mean that the symptoms mentioned are due to an infected vesicle, but that if the inflammation is so acute as to produce such symptoms there is more chance of the infection having spread. I do not think that vesicle infection is looked for or infection suspected often enough; serious constitutional disturbance at the beginning of an acute gonorrhœa is more frequently ascribed to a lack of resistance of the individual to a virulent organism than to infection of any particular part of the urinary tract.

An infected sac in other parts of the body with such poor drainage as the vesicle always gives rise to constitutional disturbance, and it is reasonable to assume that the same may be true of the vesicle. In most cases of acute gonorrhœa there is some rise of temperature in the evening, but if this should rise as high as 102° or 103°, especially with symptoms of synovitis, vesicle infection should be suspected.

A large number of these cases are never suspected, and if the anatomy of the vesicle is a simple one drainage is good and the case clears up quickly. If the condition is suspected the possibility of a subsequent chronic vesiculitis should be borne in mind and after convalescence these cases should be submitted to a searching examination. The great difficulty is the silence of the disease and the fact that there are no signs or symptoms which can be stated to be pathognomonic. On account of the loose covering of the vesicle a considerable amount of distension can take place without causing pain and, unless there is complete blocking of the duct, symptoms are not likely to draw attention to the infection.

FIG. 4.

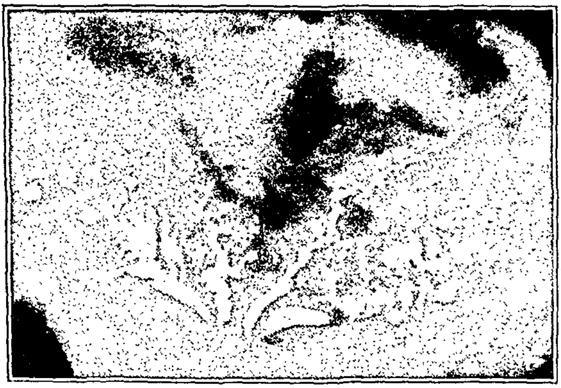


Mention must be made of those rare cases written of by Jordan Lloyd[4] in which there is an acute spermatocystitis with blocking of the ejaculatory duct and spread of infection into the cellular tissue. Here there is at once the appearance of serious illness, with high temperature, perineal and rectal pain, relieved by emptying the bladder, and frequency of micturition.

In the milder forms of vesiculitis, on which I wish to lay stress, two symptoms may be present: hæmospermia—which is rare—and priapism. Pain, if present, is more likely to be due to an associated prostatitis, on account of the toughness of the capsule of the prostate, which resists stretching. Of signs there are few and rectal examination is disappointing, as these vesicles cannot be felt in the acute state. There is, however, one sign which may have a bearing on the condition. If rectal examination is made with the patient in the knee-elbow position during the acute stage of a severe attack of gonorrhœa, a turgescence can sometimes be felt which spreads over and above the prostate, obliterating its characteristic outline and shape. Although no proof can be given for ascribing this turgescence to an inflammatory condition of the cellular tissue beneath the fascia of Denonvilliers, it seems not unlikely to be the case. The condition clears up quite quickly and the prostate regains its normal shape and outline.

Chronic Cases.—The history of an undoubted chronic vesiculitis generally shows that during the original acute attack there was at some time a more serious aspect of the case such as epididymitis, high temperature, or joint pains. Cases of recurring epididymitis, first on one side and then on the other, known to the French as "epididymite à bascule," do not appear to be common in this country, but are looked upon in France as pathognomonic of vesicle infection. This relapsing epididymitis may equally well be caused by prostatic infection. The symptoms which may be present are a most inveterate gleet, chronic haziness of the urine, and rheumatism in a man who has at some time had a troublesome gonorrhœa. Gleet may be present alone in the absence of any discoverable cause.

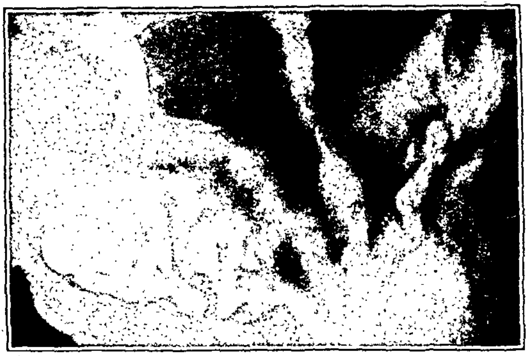
FIG. 5.



Microscopically the pus from the meatus may be mostly old and degenerated, but now and then fresh pus may appear which stains well. Organisms of a secondary infection may be present, and occasionally the gonococcus. On account of the intermittent appearance of the gonococcus, repeated examination for it should be made. In a case under my care eight months elapsed before a good specimen could be obtained. The macroscopic appearance of the gleet varies from a thin, sticky secretion to a genuine yellow pus, and, characteristically, it may be absent for weeks and then appear again. It usually yields quickly to urethrovesical lavage.

In a relapsing chronic case of gonorrhœa the haziness of the urine, as described by Kidd,[15] is very suggestive. This haziness is present when other causes of a hazy urine have been excluded and if the anterior urethra has been thoroughly washed before urine is passed. On the other hand, the urine may be clear, and this may be explained by the fact that the emptying of the vesicles is intermittent and the examination may be made soon after the vesicle has emptied itself. In the presence of a gleet and a hazy urine rheumatism is commonly present and attacks muscles as well as joints. Hæmospermia is an uncommon symptom in either acute or chronic vesiculitis. It is looked upon by some as pathognomonic.

FIG. 6.



Symptoms may be almost absent and the condition may come to light only in the investigation of an obscure case of rheumatism and the discovery of a hazy urine.

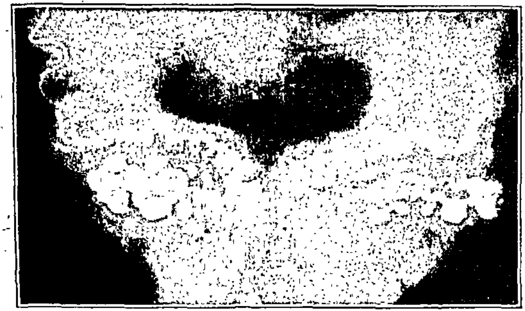
The anterior urethra should be thoroughly explored for infected Littré's glands and the posterior urethra for abscesses and pockets which drain badly. It is possible, though it is rare, to see pus exuding from the ejaculatory duct. I have seen this once only. The posterior urethroscopy should be made at least a fortnight before the vesicles are investigated, because this examination, although causing very little disturbance to the patient, may give the urine a hazy appearance which clears up in a few days. The anterior urethra is washed by irrigation with sterile saline until the washings return clear. The urine is then passed into a glass; it may have the typical haze due to pus. The bladder is filled with saline by Janet's method and immediately evacuated by the patient. This ensures that both the anterior and posterior urethra are free of pus or débris. The bladder is filled for the second time with saline. If it is difficult for the patient to relax his compressor sufficiently to allow saline to enter his bladder an injection of 5 per cent. novocain into the anterior urethra can be held in with a penile clamp.

RECTAL EXAMINATION.

The next procedure is rectal examination, which plays an important part both in diagnosis and treatment. Much has been written about examination and massage of the prostate and vesicles, and opinions vary from those who maintain that there is little to be gained by the method to those—like François quoted by Chauvain[14]—who maintains that he is able to differentiate five separate forms of vesiculitis!

I decided to investigate 35 cases in the post-mortem room to see whether the vesicles could be satisfactorily reached by the examining finger. The cadaver was placed in a leaning position over the side of the table. The sacrum was removed, leaving the coccyx with its lateral attachments. The vesicles were then sufficiently exposed to view without removing the rectum. It was found that with a finger of average length inserted into the rectum every part of the vesicle could be reached in the majority of cases, but that the vesicles, if normal, could not be felt as distinct structures. In some cases, however, where the prostate was enlarged in the anteroposterior direction, the finger by no means reached the vesicle satisfactorily. Sometimes the vesicle is more vertically placed on the posterior surface of the bladder than the usually accepted horizontal position, and this may place its fundus out of reach.

FIG. 7.



Therefore, in massage of the vesicles, the observer must be absolutely sure of being able to reach the upper margin of the prostate. If this can be done, most efficient massage can be carried out. In the great majority of cases of vesiculitis the vesicle cannot be felt and massage should be done along the upper margin of the prostate, as this corresponds exactly with the position of the vesicle. For palpation of the ampulla of the vas the beginning of the V-shaped portion of the prostate should be sought, as this corresponds with the position of the ampulla. Sometimes a thickening can be felt in this position.

Another fact which interferes with the efficient massage of the vesicle is a deep perineum in a fat subject, when the finger may fail to reach beyond the middle of the prostate.

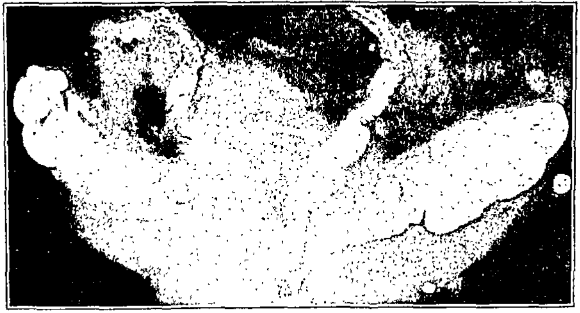
In rectal examination of the living subject in the knee-elbow position, a hand on the abdomen pushing down the pelvic contents is a great help. A proof that the vesicles are often impalpable is the fact that indiscriminate massage of the prostate will often bring away the flocculent masses typical of vesicle secretion without the surgeon being aware that he has touched more than the prostate. After the bladder has been filled for the second time the prostate and vesicles are massaged together.

Chauvain[14] recommends massaging prostate and vesicle separately and quotes Cabot as doing the same thing, and for this purpose filling the bladder a third time, but anyone who has had experience of rectal examination in these cases knows that such separation is hardly practicable. Some help in diagnosis is forthcoming from the feel of the prostate, which is so readily palpable; tenderness, hardness, or even fluctuation may point to a prostatitis. It is, however, important for the bladder to be filled with saline, as subsequent passage of its contents by the patient will wash secretion away which may have fallen back into the bladder. Preparation is made for the collection in a watch-glass of any secretion which may come from the meatus during the massage, and films are made from this in search for pus or organisms. If cultural examination is desired the meatus must be carefully cleaned with spirit, and the urine must be passed into a sterile bottle through a sterilised glass funnel. It is important to use sterile saline in preference to weak antiseptic, because the latter interferes with the staining properties of pus and organisms.

EXAMINATION OF SECRETION.

The macroscopic appearance of saline passed after massage of the prostate and vesicle is important and helpful. The fluid may be clear with solid particles or cloudy with solid particles. The cloudiness may be due to phosphates or free pus. The addition of a little acetic acid will at once eliminate phosphates, but some of the fluid should be set aside for microscopic examination before the acid is added. Both of these appearances may be due to an infected prostate. If the precaution has been taken of examining the posterior urethra, as previously suggested, and any gross lesion of that part eliminated, no quantity of pus is likely to come from the prostate.

FIG. 8.



The most characteristic appearance of vesicle secretion in saline is the presence of large flocculent spermatocystitis with blocking of the ejaculatory duct and spread of infection into the cellular tissue. Here there is at once the appearance of serious illness, with high temperature, perineal and rectal pain, relieved by emptying the bladder, and frequency of micturition.

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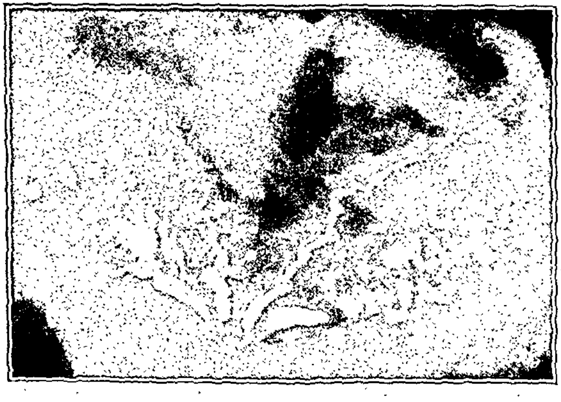
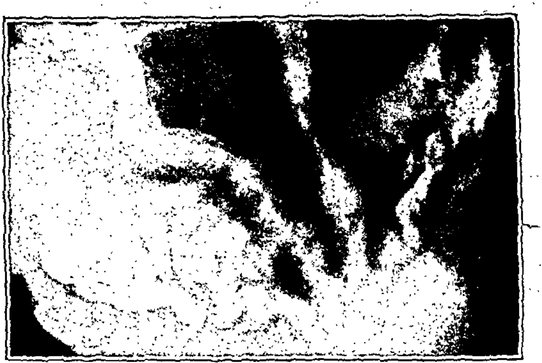
FIG. 5.



Microscopically the pus from the meatus may be mostly old and degenerated, but now and then fresh pus may appear which stains well. Organisms of a secondary infection may be present, and occasionally the gonococcus. On account of the intermittent appearance of the gonococcus, repeated examination for it should be made. In a case under my care eight months elapsed before a good specimen could be obtained. The macroscopic appearance of the gleet varies from a thin, sticky secretion to a genuine yellow pus, and, characteristically, it may be absent for weeks and then appear again. It usually yields quickly to urethrovesical lavage.

In a relapsing chronic case of gonorrhœa the haziness of the urine, as described by Kidd,[15] is very suggestive. This haziness is present when other causes of a hazy urine have been excluded and if the anterior urethra has been thoroughly washed before urine is passed. On the other hand, the urine may be clear, and this may be explained by the fact that the emptying of the vesicles is intermittent and the examination may be made soon after the vesicle has emptied itself. In the presence of a gleet and a hazy urine rheumatism is commonly present and attacks muscles as well as joints. Hæmospermia is an uncommon symptom in either acute or chronic vesiculitis. It is looked upon by some as pathognomonic.

FIG. 6.



Symptoms may be almost absent and the condition may come to light only in the investigation of an obscure case of rheumatism and the discovery of a hazy urine.

The anterior urethra should be thoroughly explored for infected Littré's glands and the posterior urethra for abscesses and pockets which drain badly. It is possible, though it is rare, to see pus exuding from the ejaculatory duct. I have seen this once only. The posterior urethroscopy should be made at least a fortnight before the vesicles are investigated, because this examination, although causing very little disturbance to the patient, may give the urine a hazy appearance which clears up in a few days. The anterior urethra is washed by irrigation with sterile saline until the washings return clear. The urine is then passed into a glass; it may have the typical haze due to pus. The bladder is filled with saline by Janet's method and immediately evacuated by the patient. This ensures that both the anterior and posterior urethra are free of pus or débris. The bladder is filled for the second time with saline. If it is difficult for the patient to relax his compressor sufficiently to allow saline to enter his bladder an injection of 5 per cent. novocain into the anterior urethra can be held in with a penile clamp.

RECTAL EXAMINATION.

The next procedure is rectal examination, which plays an important part both in diagnosis and treatment. Much has been written about examination and massage of the prostate and vesicles, and opinions vary from those who maintain that there is little to be gained by the method to those—like François quoted by Chauvain[14]—who maintains procedure, on account of the amount of pressure necessary to occlude such a thick-walled tube.

The antiseptics for injection are numerous, but those mostly used are collargol 5 to 10 per cent., argyrol 5, 10, and 25 per cent., silver nitrate 1 to 2 per cent., and silver protein (Thomas) 20 per cent.

VASOTOMY.

Although no large number of cases of successful vasotomy has been published in British literature there is ample evidence of the success of this small operation in other countries. Belfield, in 1143 cases, had 80 per cent. of cures, Cumming[18] reports 336 cases, and Thomas 94[3] with 37 per cent. of cures. Cumming and Glenn[17] record 65 cases with 61 per cent. of cures, and Baker[21] 75 cases with 40 per cent. of cures.

An important objection to the operation is the slight risk of stricture of the vas and consequent sterility on that side. Thomas and Birdsall,[22] experimenting on 20 dogs, found that stricture occurred in half the cases of vasotomy and in only 5 per cent. of vasopuncture. They used 5 and 10 per cent. collargol. In the vasotomy cases the vas was sewn up with catgut. When stricture occurred it was always at the site of incision of the vas. This would appear to be an argument in favour of vasopuncture, although the vas of the dog may not be comparable with that of man.

Whatever the exact function of the seminal vesicle, one rôle ascribed to it is an influence on the fecundity of spermatozoa. Whether this be so or not a chronically inflamed vesicle is not one which can carry on its function normally, and it is possible that restoration of the vesicle to normal may account for cases reported by Luys and Cumming[18] in which spermatozoa, absent before vasotomy and lavage of the vesicles, have reappeared afterwards. In an analysis of 87 cases of suspected vesicle infection in which histological examination of the semen was made, Luys[1] found that 23 per cent. contained no spermatozoa, which means that in vesicle infection about 25 per cent. of cases are sterile. Belfield[23] had sufficient confidence in the operation to operate on four men each with only one testicle. After vasotomy the semen was normal in all four cases. Clinton Smith,[24] who always does double vasotomy, reports 100 cases operated on; in 99 normal spermatozoa were present after operation.

In rebellious cases the only alternative to many months' treatment is vasotomy, and although one injection may not cure at once it is a great help to further treatment along ordinary lines. It is maintained by some that after vasotomy drainage is better, and this is emphasised by Baker,[21] who reports that in four cases after vasopuncture the gonococcus, which was absent before operation, reappeared afterwards. As illustrated by the radiograms, infection of the ampulla of the vas must be looked upon as a potent cause of chronicity. Except by very indirect means, it is impossible to reach the infection in this position, as the whole ampulla cannot be reached by the massaging finger. The slow emptying of the vas—except by muscular contraction—combined with a simple type of mucous membrane may account for the good results of vasotomy. The antiseptic may remain in contact with the interior of the vesicle as long as 21 days. The evidence of this is that urine may be stained with collargol or argyrol for this period after injection of the vas.

There are writers who state that vesiculitis is always bilateral; and they advocate that vasotomy should always be done on both sides. Recurrent epididymitis on one side only would point to infection of the ampulla and vesicle of that side and would indicate a single vasotomy.

If sterility due to double epididymitis already exists, the production of another stricture higher up the vas does not add to the patient's disability. If, on the other hand, the sterility be due to an inflammatory condition of the vesicle, fertility might be re-established. An argument in favour of earlier operation is that the small diverticula are less likely to be shut off by chronic inflammation which would prevent antiseptics reaching them. I do not wish to advocate that this little operation should be undertaken light-heartedly, but all authors agree that good technique minimises the incidence of stricture.

Case Report.

A man, aged 25 years, contracted gonorrhœa for the first time in India in May, 1928. He irrigated himself with potassium permanganate for 15 days, when the discharge suddenly stopped. Three days later left epididymitis developed, and intravenous iodine was given. Four days later right epididymitis appeared. He then went to hospital and remained there two months. The right side subsided, but the left, after recovering, relapsed. After a month in hospital some massage of the prostate was done and the only other treatment was intravenous sodium iodide. After leaving hospital he gave himself vaccines and reported to me that whenever he took alcohol the meatal discharge returned.

He was first seen by me on Feb. 18th, 1929. There was then a little mucoid secretion at the meatus which contained only degenerate pus cells, but no gonococci. The anterior urethra was irrigated and the washings contained a few pus threads, but one wash was sufficient to clean it. The urine was then passed and was hazy and contained pus threads. The bladder was filled with saline by Janet's method. The prostate was normal in size and consistency. The vesicles could easily be reached but could not be distinguished as palpable organs. In the position of the ampulla of the vas a pea-like body could be felt on each side of the middle line; these were diagnosed as thickenings in the ampulla.

The saline passed after massage contained free pus but no gonococci. On Feb. 20th thin pus appeared at the meatus and typical gonococci were found. On Feb. 27th under general anæsthesia the posterior urethra was examined. The verumontanum appeared healthy, no old prostatic abscess was seen, and the ejaculatory ducts were not visible. From March 4th until May 21st the prostate and vesicles were massaged about every four days and, although the urine began to clear and the amount of secretion expressed as seen in saline passed after massage was far less, the gonococcus was still present in films from the meatus. In addition to massage diathermy per rectum had been given and also instillations into the posterior urethra of 5 and 10 per cent. argyrol. The patient now began to complain of rheumatism in joints and back, and in spite of continuous treatment the gonococcus could still be found in films. The anterior urethra was carefully explored for any possible focus of infection, with negative result. A fresh specimen of semen was examined and found to contain almost pure pus. No spermatozoa or gonococci were found.

I decided to do a double vasotomy and wash out the vesicles for the following reasons: (1) the gonococcus was still present; (2) there was good reason to think that the vesicle was the part of the urinary tract infected; (3) the patient had coöperated fully in treatment for five months; (4) rheumatism had begun and was getting worse; (5) the patient was sterile, following double epididymitis; and (6) he was very anxious to get well and resume his occupation in the tropics.

On July 25th, 1929, under general anæsthesia, the right vas was exposed by a small incision at the lower end of the inguinal canal, incised, and injected with 9 c.cm. of 10 per cent. argyrol. The same was done on the left side, but as there was more resistance to the flow of the argyrol on this side only 5 c.cm. were injected. On both sides about 1 c.cm. of sterile saline was injected before the argyrol in order to ascertain that the lumen of the vas was clear. The vas was closed with 5/0 catgut. The urine was stained with argyrol for a few days. All signs and symptoms cleared up without further treatment.

Six months later saline passed after massage of the vesicles was reported as containing no pus or bacteria.

Fresh semen was free of pus, but there were still no spermatozoa. The urine was clear.

Summary.

1. Catheterisation of the ejaculatory ducts and lavage of the vesicle by this means is not practicable at present.

2. During the treatment of acute gonorrhœa the possibility of infection of the vesicles should be borne in mind, especially in those cases which show severe illness or early complications. These should be carefully scrutinised after convalescence.

3. The investigation should follow the lines suggested under diagnosis.

4. Indications for vasotomy:—

(*a*) In protracted cases lasting over five months in whom other treatment has been tried, especially if rheumatism is present.

(*b*) In resistant cases in whom, owing to a deep perineum, it is impossible to massage the vesicles efficiently.

(*c*) In cases where the coöperation of the patient is doubtful during a long course of treatment and where the disease hinders him from continuing his occupation.

(*d*) Where sterility is already established by previous double epididymitis.

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BIRMINGHAM HOSPITALS.—The report for 1930 of the Birmingham General Hospital states that the financial position is now very serious. There is an overdraft of £20,000 in excess of the remaining unsold free investments, and the governors recently decided to promote a Bill in Parliament for the amalgamation of the General and the Queen's Hospitals. A committee of three experts has been appointed to investigate the position, and representatives of the hospitals council are to discuss how best the financial difficulty can be removed without detriment to the work. In 1930 the income was £79,902 and the expenditure £100,779; in the preceding year the income was £82,656 and the expenditure £90,611. The report states that the Queen's Hospital is in a similar position. It had been expected that the contributory scheme would be able to pay £3 a week in respect of members admitted, and the governors' financial policy had been based on that assumption, but at present the scheme can pay only about half that amount. In-patients last year numbered 7682, an increase of 625; out-patients were 59,282, an increase of more than 1400.

THE IMPORTANCE OF KERATOMALACIA AS A CAUSE OF BLINDNESS IN INDIA.

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WITHIN the past year keratomalacia has figured somewhat prominently in current medical literature. Various features of the condition (so-called), which is very familiar to ophthalmologists in many parts of the Orient, have been presented afresh to the profession in a more interesting light, and previously unrecorded clinical evidences of this deficiency-complex have been noted. Prominent amongst the papers which have appeared are those by Pillat of Vienna,[1] based on material studied in China. He has presented a study of keratomalacia as met with in the adult which, despite errors and omissions, is perhaps the most complete and up-to-date assemblage of the diverse pathological changes which go to make up this complicated clinical picture of deficiency disease; for all practical purposes his exposition serves equally well for children. To my mind, however, the one great outstanding feature of keratomalacia is its enormous importance as a cause of preventable blindness. This aspect of the disease has not yet been fully appreciated, even by observers of the condition who live in countries like India, where, according to McCarrison,[2] faulty nutrition is the great basic cause of the bulk of the ill-health. Pillat does refer to it, but with scarcely sufficient emphasis; he says: "Keratomalacia of adults as well as in children ends so frequently in blindness in China that it represents also a social problem to which the attention of the government and officials should be turned."[3]

I have for several years felt much more strongly than this on the economic question, and my experiences and observations extending over a decade lead me to state that keratomalacia is almost certainly the chief cause of preventable blindness in children in the greater portion of the Indian Empire, and where similar conditions of malnutrition exist in other parts of the world it is likely to be of similar importance. I say "almost certainly," because it is impossible to prove such statements by recourse to records in a manner which would satisfy a statistician. Figures for the general public are unobtainable, so we must form opinions from our hospital population. In so far as the Madras Hospital is concerned—and it deals with about 20,000 out-patients per annum, fairly representative of the South Indian population—keratomalacia is responsible for more blindness amongst children than any of the other great blinding conditions of youth—i.e., irritant remedies, smallpox, ophthalmia neonatorum, syphilis, and trachoma. Last year, for example, 187 cases of keratomalacia were registered at the out-patient department. Dr. P. A. Narayana Iyer, in charge of this department, kept a special record of 95 of the more advanced of these in which the eye lesion threatened vision. The record shows that 67 were under 5 years of age, that total blindness occurred in 30 cases, and practical blindness in 70 per cent. As compared with this, there were 59 cases of ophthalmia neonatorum and lesser numbers of the other conditions mentioned above. In only five of the 59 was vision totally lost, and in only three others was it seriously interfered with. Our experience has been that blindness is a very much more common sequel to keratomalacia than to ophthalmia neonatorum. This may possibly be associated with the fact that gonorrhœa, especially ophthalmia neonatorum, appears to run a milder course in this part of India than it does in England.

Coming first in the blinding diseases of youth, the importance of keratomalacia as a blinding disease at all ages may be gathered from a comparison with the position in England and Wales, where ophthalmia neonatorum is held to be the chief cause of blindness.[4] Although the actual number of blind under 5 years of age in England and Wales for recently recorded years is small (under 500 in 1911 and under 300 in 1927), and not half of this number is accounted for by ophthalmia neonatorum, still its effect calculated up through the different age-groups, in spite of the lessening effect of the death-rate, makes ophthalmia neonatorum the greatest single cause of blindness. Causes such as ophthalmia neonatorum which operate heavily during the first five years apparently have a major influence on the total number of blind persons.

Assuming that no other massive causes of preventable blindness come into play during the later age-groups in the Madras Presidency, it is perhaps permissible to argue that, if keratomalacia is our greatest cause of blindness in the first five years of life, it is also the greatest probable cause of preventable blindness at all ages. Looking at the actual census figures for the Madras Presidency, 1921, we find that the total number of blind (37,162) is less than that for England and Wales for 1911; but the number of blind at five and under in Madras (768) is enormously greater, which appears to strengthen the argument. The Indian census report gives as its final age-group, "70 and over," and at this period we find an enormous rise in the actual number of blind as compared with the numbers in the preceding five-yearly periods. Such a rise, however, in a combined group of the last few age-periods hardly affects the question, even though it may be accounted for by a single cause; cataract, for example, with which we are not concerned as the definition "preventable" excludes it.

Keratomalacia, then, in so far as we are able to estimate, is the greatest cause of preventable blindness in the Madras Presidency in the first five years of life, a much greater cause in these years here than is ophthalmia neonatorum in England and Wales. This position with regard to keratomalacia is not, however, peculiar to the Madras Presidency. The professors of ophthalmology at Calcutta, Bombay, and Lucknow, Lieut.-Colonels Kirwan and Duggan, and Dr. Acharya, assure me that the same is true in Bengal, Bombay, and the United Provinces respectively. On the other hand, Colonel Dick, professor of ophthalmology, Lahore, informs me that keratomalacia is practically unknown in the Punjab. One of the great differences between the Punjab and the other areas mentioned above which influences the occurrence of keratomalacia is that the food in the Punjab gives a more complete diet, as pointed out by McCarrison.[5] The inhabitants are largely wheat-eaters, not rice-eaters; moreover, the Punjabis also consume larger quantities of milk and milk products and other vitamin A-bearing foods. Hence there is very little deficiency disease in the Punjab.

The disease in adults, if not so frequently met with in India, has been well recognised, although one might gather from Pillat's work that it was practically unknown. Undoubtedly in India the disease as observed in children had been much more stressed because of its greater frequency, but the disease in adults was well known and recognised in the teaching ophthalmic centres throughout this country. For example, in Maynard's "Manual of Ophthalmic Practice," largely used by students in this country for a number of years, we find, "the condition is not infrequently seen in adults." Nor is Pillat correct in thinking that I omitted to give relative figures for adult keratomalacia, or that my recognition of keratomalacia in the adult was based on Kirkpatrick's opinion. The disease in adults and also its relative frequency and importance as compared with the juvenile disease were well known to me, and actual figures are given in my annual hospital reports for 1921 and 1922.[6] Now, although adult keratomalacia is not so common in India as it appears to be in China, yet the fact of its occurrence in appreciable amount adds still further to its influence on the total blindness in the country, because, unlike ophthalmia neonatorum, it operates through all the age-periods.

Importance of Various Vitamins.

It is, I think, unfortunate that the name keratomalacia should be used for a generalised disorder of malnutrition in which ophthalmic features, however noteworthy, are but localised signs of a multiple deficiency-complex. The chief primary ætiological factor—but not the only factor, in so far as our present knowledge goes—would appear to be a lack of fat-soluble vitamin A in the diet. It had long been recognised that the various eye signs and symptoms and the many other associated pathological states of the body in this disorder were primarily due to malnutrition. Later, the whole gamut of changes was ascribed, perhaps prematurely, to a deficiency in vitamin A. To-day, however, there are some who consider that it is not a pure vitamin-A deficiency but a multiple deficiency. Some years ago, in looking for other elements in this complex, I held and promulgated many mistaken ideas on the subject of keratomalacia, and probably continue to do so. Some of my former ideas were published, in connexion with the clinical investigations which have been undertaken in our out-patient department for the past ten years, in the annual reports of the hospital. To-day, however, I would hardly be bold enough to say that the clinical condition so well known here in all its phases, both in children and adults, as keratomalacia, was even initially due to a deficiency in vitamin A alone. In discussing this question with Colonel McCarrison recently, I gathered that there is much to suggest that vitamin-B deficiency may play a part in causing its protean manifestations. I refer, of course, to the earliest evidences of the deficiency complex; later on, the organs and tissues damaged by the primary deficiency cease to play their normal rôle, and there are secondary disturbances due to altered function—e.g., endocrine function. It is very difficult, even under conditions of experimental research in animals, rigidly to exclude all but one known vitamin from the diet. In clinical investigations it is impossible to observe the effect of a steady insufficiency of any one essential food factor, and so experimental work with human material is exceedingly hard to plan and interpret. The experimentally produced animal disease probably presents much truer and simpler pictures than those seen in the clinic. Some years ago I did not take this sufficiently into account, and failed to give proper credit to the fact that the human condition known as keratomalacia was a deficiency-complex involving a greater number of factors than the experimental one known as xerophthalmia, and that this was sufficient to account for the apparent differences met with under natural and experimental conditions.

In so far as human cases are concerned, after various essays in experimental feeding we are at least able to say that crude cod-liver oil in suitable doses is the most effective agent in eliminating the major signs and symptoms of this deficiency-complex. This oil is probably largely effective by virtue of its vitamin-A content, but it also contains vitamins B, C, and D. There is no proof that it is the fat-soluble vitamin A alone in cod-liver oil which produces the beneficial effects in keratomalacia. Recently Dr. R. Muthayya of my staff has administered pure fat-soluble A (B.D.H.), kindly supplied by Colonel McCarrison to children suffering from this disease, but they did not improve so rapidly as they ought to have done on crude cod-liver oil. In all probability it requires an initial multiple vitamin deficiency, with a secondary multiple dysfunction of glandular structures to account for the whole picture of degeneration, loss of function, wasting, necrosis, secondary infection, and death, which we see in keratomalacia. It seems more than likely that the principal initial factor is an A-deficiency and that certain of the prominent clinical features are due to the effects of this deficiency on important tissues and organs of the body, such as the epithelial surfaces of the integument and mucous membranes and their glandular diverticulæ.

Secondary Infection.

Animal experimentalists appear to lay a great deal of stress on bacterial invasion as a primary resultant of vitamin-A deficiency. This vitamin may be more important to animals in an anti-infective rôle than it is to man, because clinically it is difficult to find much support for this hypothesis. In man masses of organisms can be found in the epithelial debris of which some of the discharges are largely made up, but a localised necrosis may occur—e.g., in the cornea—without any of the evidences of acute organismal infection. An extensive necrosis of the substantia propria may be present with a practically intact epithelium. As Pillat shows,[7] a patient may have a most indolent undermined skin ulcer, with a minimum of inflammatory response, in which the ordinary pathogenic organisms carry on a localised and apparently saphrophytic existence. Organismal infection, as the clinician understands it, is only seen as a terminal event. Children may drag on for weeks in a state of extreme marasmus, with recognisable pathogenic organisms present in large numbers in their usual areas of invasion—e.g., respiratory tract, skin, and conjunctiva—without any specific change taking place. Such children may be transformed in a fortnight by cod-liver oil—sometimes administered on a flannel binder when the alimentary tract is too damaged to retain or use it—in a way that they could never be if bacterial invasion were the key to the position.

The primary pathological picture in the keratomalacia deficiency-complex is one of degeneration and wasting of epithelial surfaces, almost as distinctive a process as any of the classical degenerations. There is a tendency to proliferation, and metamorphosis to a lower type; columnar cubical epithelium tends to become squamous—e.g., in the respiratory tract. In certain situations—e.g., the skin—the pathological change is akin to the degenerative changes of senility. The clinical impression conveyed is that the effect of organismal attack in human keratomalacia is a late secondary association. Rises of temperature and blood changes are also probably secondary. I have seen numbers of keratomalacia cases, even moderately advanced, continue for weeks without a rise in temperature, but it is easy to picture how fever might be secondarily produced.

Some years ago thyroid extract was administered here as part of our routine treatment in keratomalacia, without knowing whether it would do good in the absence of cod-liver oil. We have discontinued it, as cod-liver oil by itself serves the purpose equally well. McCarrison[8] has recently demonstrated the histopathological changes in the thyroid and upper respiratory passages of white rats fed on a diet insufficient in fat-soluble vitamin. Presumably there are similar changes in the human subject, and no doubt the damaged thyroid plays a secondary rôle, but we do not know to what extent these changes are resolved by the administration of a sufficiency of vitamin A in the diet once they have started. The epithelial changes which he has described in the tracheal lining are probably very similar to those which occur in the respiratory passages in human keratomalacia.

Associated Clinical Features.

There are certain clinical features of keratomalacia which may perhaps be viewed in the light of chance associations. Prominent amongst these in South India is the association of keratomalacia and liver disease, both in adults and children. It seems to be more common in the adult, but then we see fewer cases of adult keratomalacia, and liver disease is more common in the adult general population. Some years ago I considered that this combination was much more than an association, and laid unnecessary stress on the rôle of the liver in this disease. It would be foolish to deny that the liver may become deranged late in fat-soluble deficiency, and, like the simple secreting glands of the integument and alimentary canal or the thyroid, undergo definite changes in structure and function with the production of secondary changes which in time become summated to the disease complex, but I now know that the liver may be apparently perfectly normal in advanced keratomalacia, in so far as can be made out by clinical methods and modern biochemical tests. The opportunity of seeing a diseased liver in a keratomalacic subject post mortem is rare in this hospital, and was not forthcoming until this year (January, 1930), when an adult with well-marked keratomalacia, who was jaundiced and whose liver appeared to be about normal in size, suddenly died. Even in this case I was only able to obtain a hurried examination through a "surgical" incision, as the friends were expected. The greenish, slightly roughened organ presented all the appearances of biliary cirrhosis so commonly met with here, and the microscopic examination showed the change to be of the typical obstructive type. I have no doubt that, in such Madrasi children as show an association of liver disease and keratomalacia, the usual post-mortem finding would be infantile biliary cirrhosis, a relatively common affection in children here.

I have pointed out elsewhere,[9] that a primary liver defect may be the deciding factor in precipitating generalised vitamin-A deficiency symptoms. The comparatively rapid onset of keratomalacia, in a patient living on a diet which had been efficient in keeping him apparently healthy until the development of primary carcinoma of the liver, is an example. It is well known that the liver stores fat-soluble vitamins, and perhaps it may even elaborate them. It is useless to speculate, as we now feel more confident that liver disease in keratomalacia is ordinarily a chance association—not the result of the deficiency—and the reason we see such a relatively large number of cases with this association is because liver disease in the general population is common in Madras.

Pillat does not lay much stress on jaundice and affections of the liver in keratomalacia in China; perhaps cirrhosis is not so common there. He does, however, produce definite evidence that the liver function, as tested by detailed biochemical methods, may be normal in adult keratomalacia. Some years ago we tried liver feeding as a method of treatment, but found it inferior to cod-liver oil.

The Conjunctivæ.

Icterus of the ocular membranes is not uncommon in keratomalacia in South India. Frequently the peculiar olivaceous effect of the characteristic smoky conjunctival pigmentation is superimposed on the yellow subconjunctival tissues, and similarly in the skin. Apart from jaundice, however, the keratomalacic patient sometimes presents a subicteric tinge both of skin and mucous membranes, but as a rule the smoky discoloration predominates. These three factors need not, however, be confused. The smoky pigmentation of the conjunctiva is one of the most characteristic signs of the keratomalacic complex and may be observed in its purest form as an early feature in apparently well-nurtured children, where the pigment is seen superimposed on normal subconjunctival tissues. Pillat and King,[10] in a discourse on the origin of this pigment, credited Kirkpatrick and myself with believing that the pigmentation was due to liver disturbance. Kirkpatrick,[11] reviewing their paper, repudiates this misrepresentation of his views, and I also must plead not guilty. Pictures illustrative of the eye signs in keratomalacia, made under Kirkpatrick's direction a number of years ago in Madras (copies of which may be seen in the London School of Hygiene and Tropical Medicine) make clearer than mere description the impression given to an observer of this smokiness. Pillat's suggestion that this pigmentation is indicative of suprarenal disease, although attractive, is opposed by the fact that the smokiness is one of the earliest signs of the malnutrition complex; in my experience it is often the second clear indication, night-blindness being the first. It is quite possible that the adrenal gland is affected in the keratomalacic deficiency-complex, since a pure uncomplicated deficiency of vitamin A in the food is never seen; there are necessarily other deficiencies associated with the A-deficiency. Of these the most common, in Madras at least, is deficiency of the B-vitamins (B and B_2). According to McCarrison,[12] of all the organs of the body the adrenals are the most susceptible to insufficiency of vitamin B. It is accordingly reasonable to expect signs of adrenal derangement. Probable reasoning, however, from the experimental evidence at our disposal, suggests that the gland becomes involved late, when other well-known results of the deprivation are already in evidence. Colonel McCarrison suggested that the smoky pigmentation of the eye and the otherwise inexplicable puffiness and œdema sometimes seen may be an expression of an adrenal dysfunction due to the effects of an associated vitamin-B deficiency; we have therefore undertaken an experiment with yeast feeding, but so far its results have been negative.

The second factor in abnormal pigmentation is the icteric or subicteric tinge. This is sometimes so marked as to give an impression of jaundice, but suitable biochemical tests readily prove that it is not true icterus. It is essentially a yellowness of the epithelial and subepithelial tissues. It is somewhat similar, perhaps, to the yellowness said to be due to hypercarotinæmia, but makes its appearance under opposite conditions. The third pigmentation, true icterus, has already been referred to and its frequency in Madras explained.

In spite of any opinions previously expressed to the contrary, I have no knowledge of any ophthalmoscopic intra-ocular changes which might be given a place in this complex, excepting such changes as may directly or indirectly result from the corneal lesion. Only on one occasion have I been able to examine the lenses of a baby born to a keratomalacic mother, and these were clear. This is of interest in view of von Szily's findings of lenticular changes in the sucklings of xerophthalmic white rat mothers.

In the present state of our knowledge the many interesting problems connected with this deficiency-complex are really more of academic interest than of practical importance to the ophthalmologist and public health worker. The discovery of the particular deficiency which is responsible for certain signs and symptoms is a problem which may well be left to the research worker who specialises in malnutritional disorders. That this particular malnutritional disorder should be the chief cause of preventable blindness in the Indian Empire is a matter of the greatest economic importance, but until the population becomes more nearly adjusted to its food-supply, it is difficult to see how things can be otherwise. Meanwhile, the prevention of the disease is more the concern of those departments of Government which have to do with the improvement of conditions of living and with the food-supply of the community than of the Medical Department. The general practitioner or ophthalmologist cannot do more than control those cases which come within his sphere of activities by the simple method of administering cod-liver oil. The issue of cod-liver oil on a large scale as a prophylactic measure in India would hardly be taken seriously by those who are responsible for the framing of our budgets.

The scanty references given will afford those interested in the subject a guide to the important clinical and experimental work done in this field before 1930.

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ST. MARK'S HOSPITAL.—At the annual general meeting of the governors of this hospital in City-road, London, on March 19th, it was stated that the patients waiting admission numbered 130, while in the out-patients' department attendances were last year 1440 more than in 1929. Mr. J. P. Lockhart-Mummery said that during the past three or four years it had been possible to provide a certain number of private wards which had been greatly valued by the public, 93 patients having been admitted during the past year. It was hoped in the future to increase the number of those wards. Mr. Swinford Edwards, honorary consulting surgeon, who has been connected with the hospital for well over half a century, said that the new building was almost double the size of the old. Mr. J. Sandrey, the resident surgical officer, reported that the number of admissions for 1930 was 815. While there had been an increase of major operations there had been a relative decrease in the number of minor operations, owing to the recent introduction of successful palliative measures in the out-patients' department.

NON-SPECIFIC TREATMENT OF ASTHMA.

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IN a paper[1] on asthma eight years ago I stated that it is commonly believed that in cases traceable to foods the ingested protein must pass unchanged through the intestinal wall, but that, excepting possibly in the sucking infant, there is no proof of such a leakage. We were taught by physiologists that normally only amino-acids are taken up from the intestine, but we now have proof that very small quantities of unchanged protein may be absorbed, in part by the lacteals. Mills,[2] in 1922–23, showed that when tissue fibrinogen was swallowed by man, it could be found in the blood from the finger-tip in two and a half minutes. This is now further proved by the Küster-Prausnitz reaction. It might be imagined that the inflow of minute traces of protein into the blood of sensitives would immunise the body against such proteins, but in many sensitive individuals it produces the opposite effect of activation.

Recent Work.

Oriel[3] states that one group of asthmatics manifested digestive failure and excessive decomposition of protein material in the intestines, with putrefactive bacteria. He treated this condition with glucose and ammonia; but we are told: "the most effective way to reduce putrefaction is to introduce into the diet certain carbohydrates so difficultly digestible or absorbable that they will exist in appreciable amounts throughout the length of the intestinal tract. Readily digestible carbohydrates, such as maltose, glucose, or sucrose, are ineffective, while lactose and dextrin are highly effective."[4] The implantation of aciduric bacteria normally inhabiting the intestines, such as *Bacillus acidophilus* or *B. bifidus*, has also been tried. The presence of carbohydrate protects protein material or protein degradation products from bacterial action. Thus the diphtheria and Shiga bacilli, which form toxins in protein medium, produce lactic acid in carbohydrate-protein medium and no toxin; the *B. coli* produces lactic acid and no indol.[5]

Oriel and Barber[6] have found that a proteose passed by the urine contains the antigen. This is an important fact, although the antigen cannot as yet be separated out. They also believe that "secondary antigens," the products of tissue damage resulting from the action of primary antigens on sensitised cells, particularly those of the liver, are "excreted in the urine and contained in the proteose." These secondary antigens may be a "denaturisation product of the primary antigen." "Is it not," they say, "likely that this substance is, so to speak, manufactured on the premises, a product of their own tissues?" We may call these secondary antigens "anaphylatoxin." It must be remembered, however, that if one calls the substance anaphylatoxin, it is usually regarded as being in the blood and tissues owing to the antigen having absorbed from them some substance which leaves them in a poisonous condition.

Whatever the antigen, it is excreted by proteose, and they administer very small doses of this proteose to the allergic patient. This is another proof that the proteose which I introduced in 1917 must act by desensitising the patient to the antigen.[17] Finding the proteose-peptone did not act well in certain cases, I made serum-peptone, to which a trace of agar was sometimes added. Karsner and Ecker[7] found that non-specific desensitisation with *homologous serum* in guinea-pigs was more effective than desensitisation with heterologous sera, which produced many deaths from anaphylaxis. Dale and Kellaway[8] found that homologous serum was well fitted for desensitisation in guinea-pigs. By adding proteose-peptone to the serum (and agar if desired) we get anaphylatoxin after incubation, which in small doses desensitises.

HOW SERUM PEPTONE IS MADE.

I now make the serum peptone differently.

After four hours of fasting, four or five ounces of blood are removed from the arm. This is very easily done. The arm is fairly tightly bandaged above the elbow. A short but rather wide needle is used, and its base passe through the rubber to touch the glass tubing in a very narrow cork to a large sterile tube. Two or three minutes should be quite sufficient to draw off the required bloo The tube is then rotated, and left at room temperatur until next day, when the serum is pipetted off into anothe tube. *To each ounce of the serum* 1·5 g. *of Armour's No.* peptone is added, and sometimes a trace of agar (0·006 g. which has been well boiled. At the same time about te drops of chlorofrom (=♏ 3–4) are also added. The tube i *then put in the incubator at* 37°–40° C., *and left at tha* temperature for two to three hours, when the heat is turne off. *It is left in the incubator until next day,* when th insoluble part of the peptone will be seen right at the bottom and a perfectly clear fluid above. This fluid can be poure or pipetted off. It is slightly alkaline and contains som anaphylatoxin.

Serum with agar alone was tested on guinea-pigs by Dr. Anrep, and he found that 2 c.cm. injected into the femoral vein caused considerable shock, whil 5 c.cm. of plain serum did *not* affect them.

The Treatment.

When a large number of proteins are scratche on the skin in groups of five, 16 scratches will giv the results of 80 proteins, and sometimes a positiv reaction is found, especially in children and young adults, to one or more proteins. I have had several cases wherein the withdrawal of these resulted i great benefit. The patient's food must be thoroughly masticated. If not completely digested, some of it may pass unchanged through the bowel wall into the system, and set up disturbance. Before treatmen is commenced the scratch test should be made wit peptone on the arm, using concentrated peptone solution. If the response is slight, use the peptone solution more freely in treatment; if considerable use it cautiously. Some say that peptone treatment is dangerous and must be used with great care. I always use care, but after thousands of injections have never found it dangerous, even in young children, who take it very well. Some America physicians have stated that the peptone made u in their own laboratories is much superior to tha obtained in the market.

Begin with ♏ 5 of the 5 per cent. solution o peptone and go up by ♏ 3 twice a week. Th injection, in adults at least, should usually be mad in the vein, and a quarter of a minute allowed t elapse between each ♏ 3 given. Go up to 2 or 2 or 3 c.cm. if suitable. In some patients a maximu dose of ♏ 20 is sufficient, continued for some tim Intramuscularly give 7·5 per cent. solution. after 10 or 12 injections twice a week there is bu little effect, produce a slight reaction in the patien This may require 4 c.cm. of serum peptone. Ea patient differs, and a certain percentage derive litt benefit from the treatment. Begin the seru peptone treatment with about ♏ 10, going up

♏ 5 each time until 3 c.cm. is reached. If the patient improves, say at 2 c.cm., continue at that dosage for some time. Usually it is best to begin with serum peptone after plain peptone has been tried. Novy and his associates found that guinea-pigs' serum added to the peptone mitigated the effects of the latter. When patients are nervous about the taking of their blood, give them the serum peptone from another healthy person.

I have had a good many patients in whom, after treatment, the asthma has been either entirely or practically absent for three years. In a few it has been absent many years, but it is difficult to say whether or not these have undergone a natural cure. Sometimes, after three or four courses of treatment given from time to time for a year or a year and a half, the asthma will cease.

The following case will illustrate this:

A patient, female aged 52, Londoner, consulted me in July, 1925. Her father had brothers with asthma. It began with her at the age of 16, and has practically continued ever since. Cannot sleep. Uses an inhaler every night. No expectoration. The fit passes off quietly. She had a sensitive dermographic skin. She first got 14 peptone injections, but was no better. She was resolved to go on, and had serum peptone made, getting two injections a week when she got great relief. After two months the asthma began again, and she again got 8–10 doses of serum peptone. The asthma again ceased for some months. She had two further courses of serum peptone at intervals. Since November, 1926, she has remained quite free from any symptoms of asthma.

As has been mentioned, sometimes ♏ 20 of the peptone solution is as high as it is necessary to go. A rather remarkable case was sent to me by Dr. A. H. Watt, of Johannesburg.

The patient, a male aged 67, had suffered greatly for many years. He had had many treatments in different parts of the world and was last under Storm van Leeuwen in Leyden. He was tested and found sensitive to moulds. Prof. van Leeuwen treated him for this by inoculation, but without effect. He then put him in one of his allergen-free chambers, where he considerably improved. On returning to Pretoria he erected an allergen-free chamber in his own house, but received no benefit from it. I suggested peptone alone, but as he said he got a big injection of it into the gluteal region from a doctor in Pretoria which made him very ill, he was loth to have it done. He consented, however, and he also had small doses of ultra-violet rays. He got so well that, instead of going to Mont Dore as he had intended, he went to Scotland for a change. On his return he had more injections but not even up to ♏ 20. He also had light rays. He was highly satisfied, and returned to Pretoria. He told me that he had always carried adrenalin with him, and at night had to have ephedrine and eupnine beside him.

The next case I mention was treated very differently.

A male, aged 42, was sent to me last summer by Dr. J. A. Delmege, of Weaverham, Cheshire. He had a Government appointment in West Africa, but was pensioned off in 1925. He got a severe cold which he could not shake off, and a terrible cough, so that he was obliged to sleep away from everyone else. On returning to this country, he took a dose of aspirin, which nearly killed him, and it brought on asthma. He had to go to a nursing home with asthma and bronchitis until 1928, and in that year had many polypi removed from both nostrils, which made him no better.* He came to me in a very feeble state, could only walk with difficulty, and had much asthma and great cough. His chest expanded 1¼ in. and there was considerable emphysema. He showed no reaction to 60 proteins. He had serum peptone for 16 doses. From the sixth to the twelfth injection he had anticatarrhal vaccine subcutaneously for his bronchitis, from ♏ 4 up to 1 c.cm. He had ultra-violet rays, 16 exposures up to seven minutes each for the chest and back. He also had six injections of his own blood subcutaneously, three of 5 c.cm. and three of 10 c.cm. At the end of the treatment he was a new man. His asthma had gone; he was quite fit and he could walk considerable distances. His chest expansion had risen from 1¼ to 4 in.

There was no real emphysema. It was rightly stated by Hurst [10] that emphysema occurring in asthma may be deceptive. After staying the summer and autumn here the patient wanted a change for the winter, and I advised him to visit Switzerland; to choose a low altitude at first on account of the bronchitis, but if this improved to go higher. He had a very low blood pressure. He went to Montreux (1263 feet), then to Château-d'-Oex (3180 feet), and lastly to Montana (5000 feet), where he got on splendidly. His symptoms returned in the spring, however, to some extent, and he was treated with small doses of tuberculin which did very well with him.

I may mention one other case which is remarkable in demonstrating that the vagus may show great irritation in asthma.

The patient, a male aged 28, was sent to me by Dr. Ross Taylor, of Eastbourne. He was a healthy looking young man, very spare, and, when well, usually had a strong appetite. Some of his relations have hay-fever. He had suffered from asthma off and on for nine years and was negative to all tests. He had no emphysema. When an attack of asthma began he became sick and often vomited bile; his bowels had a rapid and severe action, usually with diarrhœa, and he passed large quantities of practically colourless urine. All these symptoms showed a violent stimulation of the vagus. The asthma came on from time to time and he is quite well in the intervals. We cannot tell what toxin attacked the vagus (if it was a toxin) but it may have been autogenous. I began treatment by giving glucose and insulin 5 units twice a day. I continued this for some time, but it produced no benefit. I then gave him 20 injections (intravenous) of peptone and serum peptone and also tried him with mixed coliform vaccine, as recommended by Coke. He also had several blood injections up to 10 c.cm. He got much better, but after I gave him MacLean's alkaline mixture * [11] he said he thought it did him great good, and he took it for a long time. He also had 16 ultra-violet light treatments up to seven minutes for chest and back. He remains quite well.

It is possible that the alkaline mixture had considerable effect in mitigating the toxin. But this must be exceptional, for I tried a number of asthmatics with fairly large doses of alkali for a fortnight and then with fairly large doses of nitrohydrochloric acid for a fortnight, and they nearly all replied that they were better on the acid, probably owing to stimulation of the liver.

Results in Germany.

The peptone injection treatment of asthma and other allergies is making great headway in Germany. On this account Herr Witte, in addition to his widely known peptone (which is used chiefly for bacterial growth), has, in conjunction with a German University, produced a new peptone for injection, which he says is much less toxic than the ordinary peptone. The fatal dose of the new peptone lies between 80–100 mg. on a 100 g. rat, as against a dose of 40 mg. of the ordinary Witte peptone, and there are also clinical differences. Herr Witte has kindly sent me a quantity of this new peptone for trial. Last January he named it "peptone Witte special 30." Only a few German authorities have information about it. I have been testing a 5 per cent solution, but its full trial will take time. It is very successful, producing no irritation, subcutaneously or intramuscularly, and is quite satisfactory intravenously, but in the latter instance must be used rather cautiously. It contains the various proteoses, is very soluble in water or saline, and makes a good serum peptone. Herr Witte is pleased that "peptone Witte special 30" should be introduced to the profession in England.

Many German physicians have more recently described at great length their experience with peptone. Lately Drs. Petow and Wittkower [12] (with Prof. W. His, of Berlin) gave a minute description of the desensitising therapy of bronchial asthma. They say that the value of the skin test trials for recognising specific allergens that cause asthma is, in their opinion, apparently over-estimated for the therapy of asthma. Without knowledge or consideration of a specific allergen, good results are obtained with non-specific desensitisation. With the lack of knowledge of the specific allergen the non-specific desensitisation with peptone or tuberculin gives approximately good results. They tried 176 cases, and with peptone the good results were 60 per cent., and with tuberculin 50 per cent. The number of patients treated with peptone was 41, and 24 per cent. were free from asthma; 27 per cent. were greatly better; 29 per cent. were considerably better; and 20 per cent. were not improved. In the case of tuberculin, the number treated was 54, of whom 26 per cent. were rendered free of asthma, 26 per cent. were greatly better, 32 per cent. were considerably better, and 17 per cent. were not improved. Another very recent and long paper by Dr. Eric Urbach [13] (with Prof. W. Kerl, in Vienna) appears in the same journal. He states that Luithlem substituted for the Witte and Armour peptones a mixture of animal and vegetable peptones, with much better results, a combination which I had first recommended.[14] I have not used this combination for some time, but it may be worth while attempting it again.

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* Formulæ from Allen and Hanburys.

Prof. Umber,[15] of Berlin, states that "long years of clinical experience coincide completely with the results of Petow and Wittkower." "In my clinic," he writes, "we use almost exclusively the subcutaneous treatment with peptone, not only for asthma, but also for allergic diarrhœa, urticaria, &c. We are extremely satisfied with this method of non-specific desensitisation, having practised it for five years, and it is highly advisable to recommend same to practitioners." Dr. Loeb [16] states that "in asthma, after peptone injections, in about one-third of the cases the attacks have quite subsided, so that the patient is practically healed. In other cases the attacks have much diminished. Very effective results in allergic diseases have been reported by numerous authors."

From the foregoing remarks it will be seen that non-specific treatment must enter largely into that of asthma. Specific treatment is best when the allergen is discovered, which is not often, but even in this case it is better to use also the non-specific for some time, as the patient may fall a victim to another allergen. In fact, most patients who suffer from one allergen also suffer from others. Peptone and serum peptone are probably the best, as they cause no anaphylaxis and are suitable for all cases, however much they differ, though in some cases they fail. As the work of Oriel has shown, the proteose of the patient takes up the allergen and excretes it, which alone is a sufficient reason for the injection of peptone.

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TORBAY HOSPITAL.—Last year there were 1941 in-patients, an increase of 273. Their average stay was 22·08 days and their average daily cost was 8s. Notwithstanding that the ordinary expenditure increased by nearly £2000, reaching a total exceeding £17,300, the hospital paid its way, thanks to an increase of over £3300 in the ordinary income. What the report describes as "this really wonderful result" is mainly accounted for by the growth of the contributory scheme which last year increased by £2822 to £5475.

X RAY TREATMENT OF PITUITARY DISEASE.

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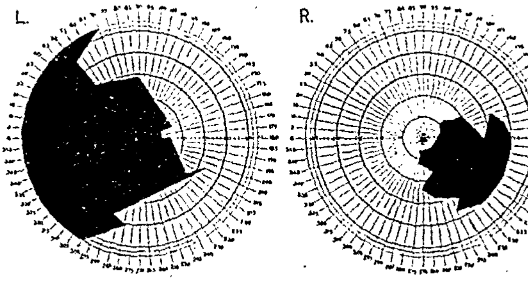
THE pituitary body perhaps appears at first sigh to be unfavourably situated anatomically for X ra, therapy. In two important respects, however, it position is singularly fortunate. First its centra position no more than 8 cm. from the temples and forehead allows it to be readily subjected to cross-fire radiation from several directions. Secondly, it i surrounded on all sides by nervous and bony tissues which, themselves highly resistant to radiation provide an ideal material for the productio of secondary scattered rays which considerabl supplement the primary rays issuing from the tube The one possible disadvantage, the risk of depilatio of the scalp, can be avoided by suitable adjustmen of the dose and even if depilation occurs it must b accounted a small price to pay for alleviation from serious pituitary disease.

To Béclère [1] belongs the credit for having in 190 been the first to irradiate the pituitary. One o his patients was alive 20 years after treatment wa begun. Schlesinger [2] found that subjective symptom and somatic changes in acromegaly were improve and also got good results in diabetes insipidus Nobécourt, Duheim, and Bize [3] reported considerabl though only temporary improvement in a boy of 7 who had lost his sight through a tumour of the sella. Vision was in some measure restored, headach disappeared, and vomiting ceased. Nemenov and Jugenburg [4] obtained improvement in the 18 cases of pituitary disease which they irradiated. Headach disappeared and in some cases vision showed remar able improvement, those who at first were almos blind being subsequently able to read and do fin hand work. While their most successful cases wer those of adenoma of the anterior lobe, they clai improvement also in dystrophia adiposo-genitali Cerni and Gejnisman [5] found similar results regards acromegaly but less constant improveme in dystrophia adiposo-genitalis. Where the ophthalm symptoms were already advanced there was permanent improvement. Magnus [6] out of 34 cas obtained the best results in benign adenomata the anterior lobe. The results were less good acromegaly, endotheliomata, and cysts. Hamann found six out of ten cases favourably influenced regards vision and the general condition. Griffith reports enlargement of the fields and disappearan

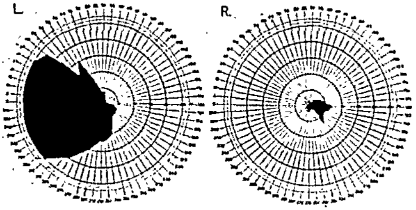
FIG. 1.



Fields of vision Sept. 18th, 1929.

of symptoms in a case showing bitemporal central scotomata following X ray treatment which was administered by Béclère. Béclère[9] considers that adenomata of the anterior lobe show the best results and since these are by far the commonest tumours, X ray treatment should in all cases be tried first. He quotes Cushing in support of this view. Sgalitzer[10] finds that benign tumours need less treatment than malignant. Cystic cases are refractory, while dystrophia adiposo-genitalis is rarely benefited.

FIG. 2.



Fields of vision June 7th, 1930.

There is therefore a consensus of opinion that adenomata of the anterior lobe are readily influenced by X rays and that in other conditions improvement is less certain. The comparative failure of X ray treatment in adiposo-genitalis is not surprising in view of the fact that this condition is generally believed to be due to atrophy and not to hypertrophy of the pituitary.

As regards dosage, most of the radiologists quoted above give about 80 per cent. of the erythema dose at 180 k.v. (kilovolts) heavily filtered through the temporal and frontal areas. It is significant however, in view of the general advocacy at the present day of high voltages, that Béclère employs a peak voltage no higher than 100 k.v.

RECORD OF CASE.

A youth, aged 19, height 5 ft. 8 in., weight 11 st. 2 lb., a butcher's assistant, was admitted to Addenbrooke's Hospital on July 26th, 1929, under Dr. G. S. Haynes. He gave a history of having injured his head through a bicycle accident three years previously. He said that he had no energy and wanted to sleep all the time. He was always hungry, ate ravenously, and was rapidly putting on weight. He complained of headache which was worse in the morning and aggravated by stooping. There was no vomiting, no polyuria, no sign of acromegaly. Vision had been failing for some time and was now very defective. Bitemporal scotomata were found in both eyes. (See Fig. 1, and note by Mr. Cooke below.) Radiographic examination showed irregularity and great enlargement of the sella turcica with erosion of the clinoid processes. (In Fig. 3 the appearance of the sella is reproduced in its actual size.) It was therefore clear that the condition was due to pressure upon the optic nerves by a tumour of the pituitary.

Treatment with X rays was begun in August, 1929. Once a fortnight 80 per cent. of an erythema dose at 180 kv., filtered through 0·5 mm. of copper and 1 mm. of aluminium, was given through the temporal fields alternatively, the field being circular with a diameter of 5 cm. After two applications vision began to improve, headache disappeared, the patient was less sleepy and his appetite had diminished. Examination of the fields of vision at intervals showed a steady and well-marked diminution of the right scotoma and a slight improvement in the left. The condition on June 7th, 1930, is shown in Fig. 2. Subsequent X ray therapy produced no further improvement in the fields owing doubtless to the fact that some of the optic fibres were permanently atrophied.

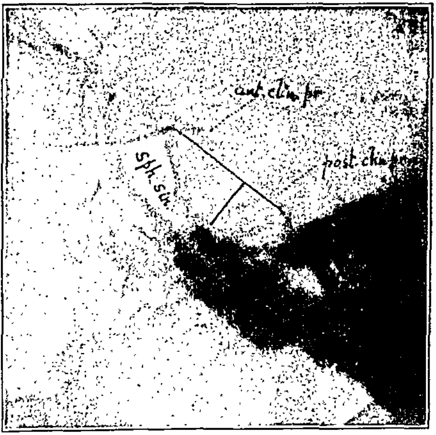
Biochemical investigation (Dr. C. G. L. Wolf) revealed in March, 1930, an increased sugar tolerance which became less in the following seven months. Basal metabolism was +4. Meanwhile all symptoms other than ocular had disappeared and vision had so far improved that during the summer of 1930 the patient was able to brave the perils of the streets on an ice-cream tricycle. In December a slight relapse occurred but this readily yielded to a few doses of X rays. At the present time (February, 1931) the patient feels perfectly well, and is fit for work but unfortunately is unable to find any.

The readiness with which this patient has responded to X ray therapy makes it probable that he is a case of simple adenoma of the pituitary. The main interest in the case, apart from the material improvement, lies in the fact that repeated examination of the fields of vision has provided an accurate gauge of the effect of treatment.

NOTE BY MR. ARTHUR COOKE.

This patient's vision was tested in April, 1927, and found to be 6/6 in each eye with a small degree of hypermetropia. In November, 1919, R.V.=6/18; L.V. less than 6/60. Well-marked bitemporal scotomata were present measured on Elliot's scotometer and recorded in Fig. 1. This condition pointed to an intrasellar pituitary tumour pressing on the optic chiasma. The remarkable improvement in the scotomata after six months X ray treatment is shown in Fig. 2. Vision improved to R. 6/6, L. 6/60. Reading small type was very slow at first owing to the scotoma in the right eye being equivalent to a partial right hemianopia, where the letters can only be picked up separately as if one were reading with a moving sheet of paper always covering the letters to the right. This has improved so much now that reading proceeds at a normal pace.

FIG. 3.



Lateral radiographic view of the sella turcica. The black lines show its length and depth.

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CLINICAL AND LABORATORY NOTES

NOVASUROL AND HEART FAILURE IN GRAVES'S DISEASE.

By J. R. Armstrong, M.B. Camb.

The following case of Graves's disease is of interest for several reasons. In the first place the disease was of long standing and, although very pronounced, was not progressing; the patient suffered relatively little inconvenience and was able to live a quiet life in comparative comfort. In April, 1930, she suffered from an attack of acute bronchitis, and from this date her trouble really began. With the advent of bronchitis she developed auricular fibrillation, and alarming œdema rapidly followed, which was so acute and extensive that I regarded the condition as almost hopeless. The patient was treated with digitalis, diuretics, and novasurol in particular, and the result obtained with the latter drug is recorded, as it appeared to be of particular interest. The subsequent history of the case is also of interest in view of the return of the heart failure, the sudden death, and the post-mortem findings.

ACCOUNT OF A CASE.

A woman, aged 53, who came under my care in November, 1929, had suffered from exophthalmic goitre of considerable severity since 1919. She was very emaciated, was 5 ft. 2 in. in height, and had averaged 7 st. 7 lb. in weight. Exophthalmos and tremor were marked, and in fact all the classical signs of Graves's disease were present. Until April, 1930, she had been walking about without discomfort, her weight had been stationary, and she had been under regular observation. At the end of April, however, she developed acute bronchitis and was confined to bed for three weeks, at the end of which time, although the chest condition was satisfactory, the pulse-rate suddenly increased and the general symptoms became aggravated. Œdema of the ankles was first noticed and spread as far as the knees, the patient improving after treatment with rest and digitalis.

During the period of convalescence, however, while the chest continued to improve, the heart began to dilate, and on May 28th auricular fibrillation was first noticed. Œdema of the lower limbs rapidly followed and quickly became generalised, the abdomen becoming acutely distended and the urinary output continuing to fall. Dyspnœa was not conspicuous, the chest was full of moist râles, and the patient continually cleared her throat of mucus and brought up small quantities of frothy sputum. As her condition was somewhat desperate, venesection was performed and several ounces of blood removed, and digitalis was given in ʒi doses three-hourly up to half an ounce. On the 29th novasurol, 0·5 c.cm., was given intramuscularly and the urinary output, which had hitherto been approximately 30 oz. per day, rose on the 29th to 64 oz. and on the following day to 70 oz. Digitalis was now given in smaller doses, together with ammonium chloride grs. 15 four-hourly. On June 1st the pulse-rate was 118, the urinary output measured 32 oz. and 1 c.cm. of novasurol was given, and in the next 24 hours 58 oz. of urine were passed. On the subsequent days—namely, June 4th–8th—the daily urinary output only averaged 34 oz. On the 9th novasurol, 0·5 c.cm., was given and followed by the passage of 72 oz. of urine in the next 24 hours. On the 13th a further similar dose was given and the patient passed 80 oz., the pulse-rate falling to 98. By this time her condition had considerably improved and the ascites had almost completely disappeared. The upper limbs were free from œdema, the voice was no longer husky, and swelling was confined to the lower limbs. A further dose of novasurol was given on the 16th and the patient passed 64 oz. of urine; thereafter steady progress was maintained. On July 7th she was free from œdema, the pulse-rate was 76, and she was able to walk short distances. On the 14th she went to the seaside to convalescence and I heard no more of her until August 23rd, when a relapse occurred. On August 25th the patient died, and on the 27th I made a post-mortem examination.

The body was emaciated, the abdomen discoloured and enormously distended, and œdema was present from the legs upwards to the tissues over the lower ribs. Several pints of free fluid were present in the abdomen, and free fluid was also found in the pleural cavities. Examination of the internal organs revealed an enormously large and vascular thyroid, œdema at the bases of the lungs, congestion of the liver and kidneys, and an enlarged heart weighing 26 oz. The latter showed dilatation of all chambers and hypertrophy of the right side; the cardiac muscle appeared to be healthy and the coronary arteries normal. The aorta also showed no signs of disease. Death had occurred from heart failure.

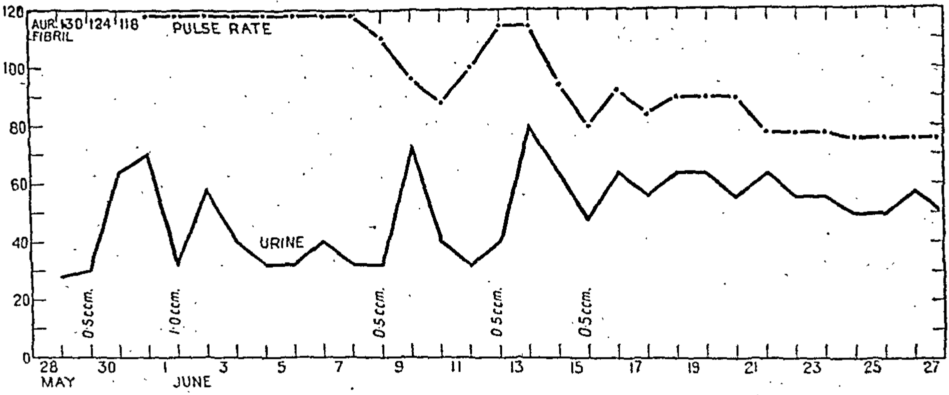

Chart showing decline of pulse-rate and increase of urinary excretion (in ounces). The decimal figures show the amount of novasurol given (in c.cm.).

Apart from the usual findings in such a case, the clinical interest lay in the diuresis following injections of novasurol which occurred earlier in the history, and in the fact that with this particular case 0·5 c.cm. was as effective as 1·0 c.cm.

ACTION OF THE DRUG.

Novasurol appears now to have obtained a definite place in the treatment of cardiac disease with obstinate œdema. Since its introduction by Zeiler, in 1917, for the treatment of syphilis, its therapeutic value as a diuretic was first observed by Saxhl and Heilig, and it has recently been used with success in America by Keith, Barnes, and Whelan, who have shown that it is more effective if combined with a low salt and low fluid intake and ammonium chloride in large quantities.

Nonnenbruch, by experiments on medical students has shown that in normal persons after the administration of 2 c.cm. of a 10 per cent. solution of novasurol there is a great elimination of sodium chloride and water, and that the drug resembles theophyllin in this respect. The effect of the drug, he found passed off in 10 to 12 hours, when compensation was effected by retention of water and sodium chloride. The superiority of novasurol over theophyllin however, is shown by the fact that novasurol still acts on the organism which has been rendered poor in water and sodium chloride by previous salt-poor days or by sweating; theophyllin does not act in these circumstances. This work has also been confirmed in America by Marvin who, although sceptical of the enthusiastic statements in the literature about novasurol, yet found that in those cases of heart disease which were characterised by large amounts of œdema and which had no evidence of renal disease, diuresis followed the injection of novasurol when it had ceased after full digitalisation. The same applied to cases treated with theophyllin, novasurol always causing a further diuresis whilst the converse was rarely, if ever, obtained. The results in these cases were determined by measurement of the urinary volume, reduction of the œdema, and changes in body-weight.

East and Bain recommend the use of novasurol in cardiac failure when treatment with rest and digitalis has first been tried and when massage and xanthine derivatives have been employed without success. In the case here described this was the procedure adopted, but it was not until novasurol and ammonium chloride were given that any great difference in urinary output occurred. The mode of action of the drug is not yet clearly understood. It is known that small doses of calomel have a diuretic action, and this is supposed to be due to the irritating action of the mercury on the renal epithelium. The variable absorption of calomel, however, makes it unreliable for this purpose, and this may be why the drug fell into disuse and neglect after it had been previously introduced in the treatment of cardiac failure in the latter part of the eighteenth century. In 1886 Jendrassik reintroduced it, and it has been used ever since. Diuresis has been shown by Flexseder to occur in rabbits after the administration of mercurials, and this observer considered that mercury lessens the absorption of food-water from the small intestines and that water reaches the large intestine in excessive quantities and is absorbed, then acting as a diuretic. It has been pointed out, however, that this does not explain the absorption of exudates.

Novasurol, which contains 33·9 per cent. of mercury, is thought by Saxhl and Heilig to diminish the affinity of tissue colloids for water and chlorides, which accordingly pass into the blood stream and temporarily dilute it. The glomeruli filter out chlorides and water together with the other constituents of the urine, but these instead of being normally reabsorbed by the tubular epithelium, pass out, reabsorption not taking place owing to diminished affinity of the latter. Crawford and McIntosh found that after the administration of novasurol dilution of the blood occurred, that an increase in the chloride percentage preceded the diuresis, and that both of them fell during the diuresis.

The administration of adequate doses of ammonium chloride or ammonium nitrate is advocated by Willius, as he found that satisfactory results could not be obtained otherwise. This has been confirmed by other observers. After the administration of ammonium chloride two characteristic changes occur in the blood plasma, one in the carbon dioxide combining power and the other in the chlorine content, and it has been shown that the urine during diuresis always shows a hydrogen-ion concentration below 6·0, varying from 5·8 to 4·6, the urine becoming decidedly more acid in two to six days after the administration of ammonium chloride.

Keith has shown that when the chlorides in the blood are low, mercury compounds fail to produce *diuresis*, and he considers that the greater and more constant diuresis obtained by the combination of novasurol with ammonium chloride is due to the increase of the chlorine content in the tissues rather than to the decrease in the alkali reserve. Whatever may be the correct explanation, however, it appears that novasurol, when combined with ammonium chloride, is decidedly more effective than when given alone, and that the combination of the two drugs frequently exerts a powerful diuretic action in cases where other measures have proved unsuccessful. In this case no toxic symptoms were observed after the administration of the drug, and the patient experienced no pain over the sites of the injections.

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INEFFICACY OF LIVER TREATMENT IN ESSENTIAL THROMBOPENIA.

BY L. J. WITTS, M.D. MANCH., M.R.C.P. LOND.,
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THE changes in the blood-platelets in pernicious anæmia after liver therapy have been carefully studied by Nittis.[1] The platelets are much diminished in the active phase of the disease. On treatment with liver they increase in numbers, reaching a level higher than normal, after which they decrease to normal values. The highest count usually occurs several days after the maximum reticulocyte crisis. There is no gross correlation between the increase in numbers of the platelets and that of the erythrocytes, the leucocytes, or the reticulocytes. Cramer[2] in 1929 suggested the treatment of essential thrombopenia by liver. This suggestion was based not only on the increase of platelets in pernicious anæmia so treated, but also on Cramer and Drew's experiments[3] on rats, in which the production of platelets was stimulated by vitamin A and ultra-violet light. Successful treatment of essential thrombopenia with liver has been reported by Mondon,[4] Holboll,[5] Jacob and Clapperton,[6] and Box and Massingham.[7]

In the present paper I am reporting the results of liver treatment in five carefully chosen chronic cases of essential thrombopenia. None was benefited, and in my opinion liver is of no value in essential thrombopenia. The published records of successful cases, to which I have referred, provide no evidence that the liver in any way affected the patient's recovery. All were isolated acute cases, and it is well known that the majority of cases of acute essential thrombopenia spontaneously get better. Proof of a therapeutic action of liver in acute essential thrombopenia would necessitate a large series of cases, and an equally large series of controls. Recently I had an acute case under my care, and was careful that no specific treatment should be given. The patient recovered rapidly and completely.

A boy, aged 3, developed *a boil on the left side of the* neck. Three weeks later he had a coarse purpuric eruption, one or two of the patches breaking down and ulcerating, and his nose bled. The spleen was not palpable. The blood count was: red cells, 4,470,000 per c.mm.; white cells, 8100; hæmoglobin, 74 per cent.; colour-index, 0·8; the differential count was normal; platelets were reduced *to 12,000* per c.mm.; *the bleeding* time was much prolonged. The boil was incised, but there was no other treatment beyond ordinary nursing care. A week after admission the platelets had increased to 23,000; a month after admission they were 250,000 per c.mm., and the bleeding time was normal.

Few maladies can inspire us with a more urgent desire to institute active treatment than acute essential thrombopenia. Few are more liable to the fallacy of *post hoc, propter hoc.* It is undesirable that in so brief and so dangerous an illness the physician should rely on a therapeutic measure of unproved worth. It is clear that the value of liver is at any rate not proved in acute essential thrombopenia, while the following cases conclusively show that it has no action in chronic essential thrombopenia.

CASE 1.—A woman, aged 54, has suffered from recurrent attacks of purpura and epistaxis since she was 9 years old. She was admitted to hospital after an epistaxis lasting 12 hours. There were several purpuric spots, and she bruised very readily. The spleen was not palpable. The only abnormality in the blood count was a diminution of the platelets to 27,000 per c.mm. She was treated with liver extract for four months without any demonstrable effect on the platelet count, and another severe epistaxis then occurred. No change occurred on omitting the liver treatment.

CASE 2.—A man, aged 50, has been attending Guy's Hospital with essential thrombopenia and secondary anæmia for 25 years. He is hardly ever free from slight epistaxis and melæna, but tolerates his disability very well and steadfastly refuses splenectomy. The bleeding time is much prolonged, and the spleen is easily palpable. At no time have I been able to find more than 15,000 platelets per c.mm. He was treated with liver extract and whole liver for four months without improvement.

CASE 3.—A man, aged 20, was one of a family of five children, three of whom have suffered from essential thrombopenia. A sister died from hæmorrhage at the age of 5. He had suffered from epistaxis and melæna for 15 years. He had never had purpura, but bruised readily. The spleen was not palpable, but the bleeding time was prolonged. His platelets were 30,000 per c.mm. He was treated with liver extract and whole liver by mouth for three months. The platelets underwent no improvement, and he had two severe epistaxes. He was readmitted to hospital for splenectomy, and died 36 hours after operation.

CASE 4.—A boy, aged 7, brother of the above, has suffered from bleeding from the gums and purpura since he was 4. His platelet count fluctuates between 10,000 and 90,000 per c.mm. He has had rather irregular treatment with liver without improvement.

CASE 5.—A man, aged 37, developed a severe secondary anæmia and thrombopenia, with purpura, hæmorrhage from the gums, and small cerebral hæmorrhages, after treatment of a chronic prostatitis. He was at first thought to have septicæmia, but improved greatly with a series of transfusions. Thrombopenia and secondary anæmia persisted. He was treated for two months with liver and liver extract, but the platelet count was unchanged and small hæmorrhages were continually present. I am unable to decide whether he is suffering from essential thrombopenia or a chronic aplastic anæmia.

In all five cases the platelets fluctuated in numbers during the liver treatment, as they do in untreated cases, tending to rise a little after hæmorrhage and sooner or later falling again below the critical level. In no case was there any permanent increase in the number of platelets, and all bled during the liver treatment. One must conclude that liver has no specific power to increase the number of platelets, and that the rise in platelets which accompanies liver treatment in pernicious anæmia is secondary to the improvement in the functions of the marrow on the resumption of normal erythropoiesis.

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A CASE OF DISSECTING ANEURYSM.

BY J. L. SWANSTON, M.B. EDIN.,

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AN engineer, a well-nourished and well-developed man aged 54, was admitted to hospital with the following history. In the morning he was carrying a pail of coals when a sharp cutting pain in his stomach made him sink to his knees and then on the floor. The pain started in his back and went round his stomach. It was continuous and severe—he writhed in agony. He felt sick, but did not vomit. He had had a sharp pain in his stomach 14 days ago while working. He had always been active and healthy. He had no urinary or biliary symptoms. Appetite was good, no indigestion, bowels regular and opened that morning.

Condition on admission.—Temp. 96·8° F., pulse-rate 60, respirations 28. *Patient writhing in agony, groaning and* short of breath. Pain all over *stomach.* Abdominal excursion, with *respiration*; large. umbilical reflex absent, slight hyperæsthesia all over. Percussion tympanitic except in right flank, where dull. Liver dullness sixth space to costal margin. Abdominal musculature very rigid, despite deep breathing. Tongue dry and slightly furred. *Pupils equal, reacting briskly to light*; knee-jerks, left, +; and right, + +. Respiratory system: slight dullness right side; vocal resonance +, vesicular breath sounds; no accompaniments. Cardiac system: apex-beat, sixth space, 4½ in. out; sounds closed. Urine: no sugar, albumin, pus, or bile by ordinary tests.

It was decided to operate, but a mid-line incision failed to reveal any abnormality *and the abdomen was closed.* *The patient's condition* remained unchanged and pain was controlled by morphia. On the following afternoon he "was feeling much better" but after a wash he suddenly became pale and dyspnœic and died.

At *autopsy* the right thoracic cavity contained one gallon of clotted blood which was displacing the lung and heart well over to the left side. The *posterior mediastinum* contained extravasated blood and the root of the lung showed a tear posteriorly and the pleural surface was otherwise healthy. The alimentary system was healthy *and the stomach* very large. The extravasation in the posterior mediastinum was seen to extend down the spinal column along the aorta and common iliacs to their bifurcation. The aorta admitted no more *than the* tips of tw fingers at any part. *It* had atheromatous changes most marked in the abdominal portion. At the junction of the arch and thoracic portion was a T-shaped rupture of intima *and media coat.* About the middle of the abdomina portion was a second rupture; it was 2½–3 in. long and i the long axis of the aorta. The intima and media coat were separated from the tunica externa by clotted bloo from a few inches *below* the lower rupture to the upper on Extravasated clotted blood was abundant around the aort but the point through which *it* had passed the tunic *externa* was not found.

The heart was enlarged and dilated. The pulmona and aortic valves were competent, with slight thickeni of *the* mitral cusps. All *the arteries had thickened* wal The kidneys showed a fine degree of chronic interstiti nephritis. Lungs and liver were congested.

This case brings forward the difficulty in diagnosi a dissecting aneurysm. The sequence of events ca however, be easily followed. A sudden slight increase in the blood pressure caused the aorta to stretch, but the inner walls being calcareous and less distensible than the elastic outer wall, ruptured at the site of greatest strain—outside of the bend (arch) and the large area (abdominal portion), the pressure of the blood then tracking into and through the walls, and eventually finding a spot to burst into the pleural cavity at the root of the lung. The abdominal pain and rigidity was referred from this area of extravasating blood, the sudden hæmothorax being the immediate cause of death.

The interesting point is the resemblance the case had to a perforated gastric or duodenal ulcer. I consider the following points were of greatest diagnostic value: (1) Site of origin of pain—viz., in the back and not epigastrium. (2) There was no period of reaction due to the dilating peritoneal fluids or shutting off by omental adhesion, &c. (3) Respiration was of large excursion, and not short and jerky as in peritonitis.

MEDICAL SOCIETIES

TUBERCULOSIS ASSOCIATION.

At a meeting of this society held at Oxford from Thursday, March 26th, to Saturday, the 28th, the Thursday session was chiefly occupied with a discussion on Stereoscopic Radiography (see p. 822). At the morning session on Friday a discussion on the

Natural Processes of Healing

in pulmonary tuberculosis was introduced by Dr. M. Jaquerod, of Leysin. Rest, hygiene, and diet as methods of treating tuberculosis were now, he said, being relegated to a secondary position. All treatment tended towards collapse therapy, and those who believed in inducing an artificial pneumothorax early were in the ascendant. Radiology had rendered invaluable service to the study of the processes of healing. Apart from certain acute and generalised forms, pulmonary tuberculosis might be regarded as a chronic illness from the beginning, and this conception should be the basis of any description of the processes of healing. Virchow's view was that all lesions of pulmonary tuberculosis necessarily originated from miliary tubercles, but there were in the neighbourhood of chronic and fibrocaseous foci congested and simple inflammatory areas which nowadays were regarded as the antecedents of chronic lesions. This conception of the pneumonic or inflammatory nature of tuberculous lesions originated in the minds of two English pathologists, Wilson Fox and Green, in 1873. Dr. Jaquerod considered that in this stage of the disease the tubercle bacilli remained on the surface of the mucous membrane between the epithelial cells, in the alveolar and intercellular spaces, and that their destruction and elimination was therefore rendered much easier. It was only when these lesions did not heal that new tissues were produced.

The question, "How recent is the disease?" was therefore a matter of primary importance. It was necessary to distinguish the non-allergic type found in childhood from the lesion of a patient already sensitised by previous contact with tubercle bacilli. In the former the pulmonary lesions might regress and heal by resolution, or pass the non-allergic phase and become serious. In the latter the inflammatory reaction was broncho-pneumonic, and might end in cavity formation. This cavity was, however, different from that of chronic disease; its walls were not well-organised pyogenic membrane, but simple inflammatory tissue. It might heal by resolution without leaving any apparent scar. A third form, *chronic fibrocaseous tuberculosis*, was a complicated process leading to fibrous transformation of the lung. The first two forms always existed before the third, and it was in these that treatment had its best chance of success.

DISCUSSION.

Dr. T. Campbell emphasised the possibility of primary infection in adult life, and regretted the concentration of attention on childhood infection.—Dr. W. C. Fowler regarded the regeneration of lung tissue as in the nature of a compensatory emphysema.—Dr. A. J. Morland pointed out the curious fact that early cavities were absolutely spherical. He thought this was brought about by the retention of air under pressure owing to the valvular opening. When the air was liberated the cavity might collapse and practically disappear.—Dr. Burrell thought Dr. Morland's suggestion might explain the existence of pleural rings, which did not fill with lipiodol or collapse with artificial pneumothorax.—Dr. G. T. Hebert adverted to Mitchell's theory of an air sac as an explanation of pleural rings or annular shadows.—Dr. C. H. Toussaint raised the administrative importance of the two factors, natural healing and active intervention. Public cost had a bearing on it. A waiting-list meant the loss of important early weeks in treatment.—Dr. G. Jessel spoke of the importance of relapses complicating the natural process of healing. He had noticed that cervical glands, after apparent healing with artificial sunlight treatment, might again relapse.—Dr. R. R. Trail said he had obtained help from the sedimentation test in estimating resistance. Apart from pleurisy, which always showed a high rate, chances were good if a patient had a rate of from 9–20 per cent. Over 40 treatment was probably a waste of time.—Dr. F. R. Walters suggested the division of the waiting-list into an urgent and a non-urgent category.—Dr. Basil Price thought that while modern views had swung back to the aerogenous theory of origin, the relation of this theory to lymphatic circulation needed more consideration than it had obtained. In his experience the Ministry of Pensions cases of chronic bronchitis and emphysema, which had been watched ever since the war, not infrequently developed pulmonary tuberculosis.—Dr. S. R. Gloyne was impressed with the different course that the process of healing took in the different natural orders in the animal kingdom. In man the processes of healing were nowadays largely studied by the radiologists, who saw the patient long before the pathologist did, and it was difficult to correlate the morbid anatomy with what was seen on the film.

In the afternoon Dr. L. T. S. Burrell and Dr. N. Tattersall introduced a discussion on the

Future of Artificial Pneumothorax

treatment. Dr. Burrell said that collapse therapy was the simplest method of applying the principle of rest to the lung. All early cases of unilateral disease would, he thought, in the near future be so treated unless there was definite contra-indication; more chronic fibrotic cases by thoracoplasty. One practical objection to collapse therapy was that comparatively few doctors understood it, and a patient might have to travel far for a refill. X ray control was practically outside the scope of the general practitioner. Collapse therapy was occasionally useful in non-tuberculous disease—e.g., to relieve severe pain in pleurisy and in the treatment of abscess of lung.

Dr. Tattersall spoke from the administrative point of view. The first problem was a definite assurance of adequate facilities for the maintenance of refills; the bulk of inductions would probably always be done in institutions. The problem of refills for patients living far from a centre was difficult. He knew of more than one large county borough where the tuberculosis officer did not undertake pneumothorax work, and he had met a sanatorium superintendent who did not believe in the treatment. It seemed to him that the tuberculosis officer must be head of the organisation for doing refills; every year more and more dispensaries were equipped with X rays. A central dispensary was the most suitable place, with special sessions set aside for the purpose. In scattered areas branch dispensaries should be utilised, and the tuberculosis officer would require a portable apparatus. The opportunity for collapse therapy was often lost owing to a patient having to wait. Collapse therapy at home took much time and placed more responsibility on the officer. Arrangements might be made with local hospitals to admit cases for a week or two while the tuberculosis officer did the preliminary induction.

DISCUSSION.

Dr. L. J. Blandford emphasised the difficulty of defining the early case.—Dr. G. Marshall considered the presence of cavity a strong indication for collapse therapy.—Dr. Peter Edwards emphasised the importance of artificial pneumothorax in bilateral cases.—Prof. S. Lyle Cummins mentioned the risk of shutting off the drainage opening from a cavity by collapse therapy.—Dr. J. Crocket remarked that the interval between refills should not be too long. Bilateral pneumothorax was justifiable in advanced cases to make the patient more comfortable.—Dr. Niven Robertson emphasised the danger of compression of the bronchus, and the consequent holding up of pus. He had been impressed with the risk of spontaneous pneumothorax.—Dr. T. R. Elliott suggested the use of the municipal hospitals as pneumothorax centres.—Dr. Edwards spoke of the value of pneumothorax in shortening the course of treatment. Phrenic avulsion immediately after induction enabled the physician to lengthen the intervals between the refills. He had found a small injection of gomenol useful in making the mediastinum more rigid. Screening as a test of movement or hernia of the diaphragm was, he thought, much more important than taking films. Accidents would happen from time to time—in his sanatorium they did about 50 refills a week, and had an accident about once in two years—dispensaries which undertook refills should have an emergency bed available.—Dr. M. Gilbert believed that phrenic avulsion shortened pneumothorax treatment, and was important where a patient could not get refills.—Dr. J. Watt raised the question of ultimate pneumothorax results. He had found it difficult to know what happened to patients long after leaving sanatoria.—Dr. Trail thought the ultimate results were hopeful. The majority of Midhurst patients remained free from symptoms and from sputum, and the treatment was definitely worth while.

On Saturday there was a discussion on Gelatinothorax, reported in our last issue (p. 758).

MEDICAL WOMEN'S FEDERATION.

At a meeting of the London Association of this Federation on March 24th, Dr. Letitia Fairfield, the President, took the chair, and a paper on

Bullous Dermatoses

was read by Dr. Elizabeth Hunt. Symptoms were so obtrusive in skin diseases, she said, that it was not surprising that the obvious lesions had been made the basis of classification, but the result was that nomenclature in dermatology was heavily overloaded. The bulla differed from the vesicle only in size, and both were signs of increased permeability of the vessel walls—a part of the defence mechanism of the skin. Whereas vesicles and bullæ were all produced by the release of a histamine-like substance, bullæ seemed to arise usually when the inflammatory reaction was intense, but sometimes they appeared on normal skin. The contained fluid was first clear but became cloudy or even hæmorrhagic. It contained albumin, fibrin strands, and cells in which eosinophils might predominate. It broke down and left a raw surface, but healing usually followed without scarring. The name pemphigus was now restricted to acute, chronic (or true), and foliaceous pemphigus and pemphigus vegetans. Acute pemphigus was very rare; there was always a history of a wound followed a few weeks later by an outbreak of bullæ with high fever. The condition was fatal and no organism had been isolated. In chronic pemphigus the bullæ appeared in crops without any inflammatory areola and their fluid was sterile. They often appeared first in the mouth or conjunctiva. There was a sensation of tightness and burning, with malaise and irregular pyrexia, but no pain save for that of conjunctivitis. Depression and insomnia followed and the patient was liable to intercurrent disease. The treatment was empirical: to maintain the strength and mitigate the misery. Septic foci should be eliminated. Arsenic was the favourite drug, but in Dr. Hunt's cases quinine had proved better. A water bed and a skilled nurse were essential. The denuded areas exposed by coalescence of the bullæ must be protected. Pemphigus foliaceus was very rare and usually occurred in young women as a persistent eruption of flaccid bullæ, which rapidly ruptured, causing a generalised exfoliative dermatitis which healed slowly. The prognosis was very grave. The diagnosis of pemphigus depended on the bullous eruption, especially in the mouth and eye. In many other conditions bullæ developed later, but were then mixed with other types of lesion.

ALLERGIC STATES.

Dr. Hunt described modern work on allergy and went on to give an account of some allergic manifestations in which cutaneous reactions occurred. Bullæ might cap the wheals of urticaria, of which the commonest cause was sensitisation to a food, though psychical factors also played a part. The treatment was to find the cause, and sometimes an injection of the patient's own proteose would succeed when all else failed. Sometimes a change of environment alone would cure the urticaria papulosa or lichen urticatus of infants, but attention to diet and small doses of grey powder were also valuable. Dermatitis herpetiformis was characterised by polymorphous lesions grouped like herpes and liable to recur. There was a marked eosinophilia but the general health remained good. Herpes gestationis or hydroa gravidarum occurred after the tenth week of pregnancy and might recur in a subsequent pregnancy. It was characterised by multiform lesions with much itching and was extremely hard to treat. Arsenic, bromide, autohæmotherapy, ultra-violet light baths, and proteose injections might be useful. It was believed to be a toxæmia of pregnancy. Cheiropompholyx caused grouped vesicles and bullæ on the palms and soles. It affected women much more than men and was apt to recur, sometimes seasonally. It had to be distinguished from eczematoid ringworm in which a fungus was found.

All these conditions had certain features in common: subjective symptoms, particularly itching, and a psychical factor in the ætiology. In some complex manner the vegetative nervous system seemed to be involved.

There were two bullous conditions of infected origin. The bullous syphilide of infants might be present at birth or appear any time after, but usually about the third week. Prognosis was bad and the treatment was mercurial. It was doubtful whether erythema multiforme belonged here as it might be produced by drugs. It was characterised by symmetrical rose-red lesions of different sizes and shapes with much exudation. There was usually a rheumatic history, and the streptococcus could often be found in the tonsils. The condition had been regarded as a streptococcide and often cleared up with rest, dieting, and salicylates. Bullous erythema multiforme was distinguished from dermatitis herpetiformis by the burning rather than itching sensation it caused. Erythema iris showed a central bulla with a target-like arrangement of concentric rings round it. Impetigo contagiosa was an inoculation of the skin by *Streptococcus pyogenes* and must be diagnosed from the bullous syphilide and epidermolysis hereditaria bullosa which was a congenital vulnerability of the skin in which bullæ were produced by blows and pressure. Finally there were bullous eruptions produced artificially, usually by young women, sometimes obviously to gain sympathy, but sometimes the patients were quite callous. The palatal and conjunctival reflexes were absent in these cases and areas of hyperæsthesia and analgesia could be found.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF MEDICINE.

A meeting of this section was held on March 13th with Dr. H. F. Moore, the President, in the chair.

Asthma due to Protein Sensitiveness.

Dr. C. J. Murphy showed a woman, aged 30, who was for a long time, he said, almost completely disabled by status asthmaticus. Skin tests showed that she was sensitive to the protein of dog dandruff and removal of her pet dogs stopped the asthmatic attacks. Dr. Murphy demonstrated the patient's skin reaction to the specific offending protein, and showed also that urticaria was provoked by rubbing her arm along a dog's coat.

Dr. E. T. Freeman said that for some years he had been carrying out skin tests in cases of asthma and of urticaria. He sometimes got good results, but at other times complete failure. He had come to the conclusion that in routine practice it was not worth while to do these tests, which were very laborious. They were better in cases of urticaria than in asthma or hay-fever. Sometimes the patient reacted to a substance with which he had never been in contact.

Dr. T. G. Moorhead said that in status asthmaticus he had found Hurst's method of almost continuous adrenalin administration of great service. As soon as the spasms ceased, the adrenalin should, of course, be discontinued.

Dr. Dorothy S. Price said that at Great Ormond-street Hospital, London, deficiency of gastric hydrochloric acid had been found in a large proportion of asthmatic children.

Dr. R. W. Shaw said that in one very troublesome case, not of asthma but of supersensitiveness to some foreign protein, in which the patient during attacks suffered from crops of herpes round the mouth and bullæ on the hands and feet, he had given a series of intramuscular injections of the patient's own blood, and the result had been extremely satisfactory.

Dr. John Mowbray said he had great faith in intravenous peptone injections, both in asthma and migraine.

Dr. Murphy, in his reply, said he had never got satisfactory results from peptone injections. He had had no experience of whole blood injections. He had had fairly good results from the use of ephedrine and of evatmine.

Œdema and Nephrosis.

Dr. A. G. Thompson reported four cases of nephrosis. This syndrome, he said, consisted clinically in œdema and oliguria, without any necessary defect of renal function; biochemically its main features were albuminuria, no evidence of nitrogen retention, a high blood cholesterol, and diminution of the serum proteins, which affected the albumin fraction more than the globulin fraction, so that the albumin-globulin ratio fell. One of his cases was fatal, and the kidneys showed a pure, or almost pure, tubular degeneration. The picture presented by nephrosis was pretty definite, but the cause was far less certain. Possibly it might be external to the kidney—for example, a primary change in the blood proteins. Nephrosis might occur by itself or might be a part of a glomerulonephritis, acute or chronic.

The President said that he had recently had several cases of nephrosis under observation, and in none of them had there been any hypertension. This was curious, for it had been shown that there was usually some involvement of the glomeruli. The appearance of a few red blood cells in the urine did not negative a diagnosis of nephrosis. It was well known that a few red blood cells might appear in the urine of a healthy person. He believed that van Slyke's "urea clearance" test was the best test of the functional capacity of the kidney. He had recently used a modification of that test with excellent results.

Dr. T. W. Dillon asked if Dr. Thompson had estimated the chloride in the plasma and also that in the œdema fluid, and, if so, what was the balance between those fluids. He said that the modern view was that disease was an affection of the whole body, appearing more markedly in one organ than in another.

Dr. Moorhead said he had long since discontinued the use of chlorine-free diets, because he knew of no evidence of chlorine retention in the blood. The retention of chlorides in the body was probably secondary to the retention of œdema fluid in the tissues.

Dr. A. R. PARSONS asked if nephrosis was merely a new term for the condition which had formerly been called chronic parenchymatous nephritis. The possible involvement of the glomeruli seemed to make it very difficult to differentiate nephrosis from glomerular nephritis.

Dr. FREEMAN referred to a case recently under his care which had benefited greatly by treatment by novasurol, and said that novasurol and salyrgan were especially useful in cases of nephrosis. He regarded the presence of blood in the urine as distinctly against the diagnosis of nephrosis. Widal had recognised that chlorides were not increased in the blood even where there was practically no chloride excretion by the kidney.

Dr. MOWBRAY felt that the term nephrosis only made the existing confusion worse than ever.

Dr. R. A. Q. O'MEARA thought that the confusion was due to insufficient consideration of the ætiology. Acute nephritis could be produced either by bacterial toxins and chemical poisons or by toxic proteins produced within the body. Some of the abnormal conditions of the kidney in pregnancy were of the last-named class. The condition of the patient depended on the degree to which the different elements of the kidney were attacked. In nephrosis much protein was lost by the kidney. As a result, the fat reserves of the body were called upon. Imperfect metabolism of fat resulted in the production of cholesterol in excess, and finally the kidney tried to excrete this cholesterol.

REVIEWS AND NOTICES OF BOOKS

A Short History of Biology.

By CHARLES SINGER, Litt.D. Oxford: Clarendon Press, Humphrey Milford. 1931. Pp. 572. 18*s*.

THIS is a readable volume in which the history of biology is set out as a series of problems partially solved, to describe the origin and development of the problems being the objective of the book. It is intended as a fundamental introduction to the study of living things, and an avoidance of technical terms, where possible, corresponds with the wish to make appeal to general readers. In the first 100 pages of the book we have a review of the doctrines and accomplishments of ancient science as represented especially by Hippocrates and Aristotle. The decline and fall of this learning marks the commencement of the Dark Ages, the suggested date being A.D. 200, or just after Galen. A thousand years later comes the thirteenth century revival of learning and the rebirth of scientific inquiry, and this section of the book concludes with an explanation of what Vesalius and Harvey did. In the next section we have set out the historical foundations of modern biology, the influence of the microscope, and the introduction of modern systems of classification; the distribution of life on sea and land is now studied intensively, and the lessons to be learnt from geology bring us to the story of evolution. The third and final part of the book traces the origin of the main themes of contemporary biology from this varied lineage, treats of the emergence of the cell doctrine, the chemistry of protoplasm, the localisation of nervous functions, fermentation and the microbic origin of infectious disease, and winds up with a description of modern work on sex and the mechanism of heredity.

The book is well written and excellently illustrated, and the author is to be congratulated upon having selected for notice from an immense mass of material the things necessary to make a coherent story.

Stepping Stones to Surgery.

By L. BATHE RAWLING, M.B., B.Ch. Cantab., F.R.C.S., Surgeon to St. Bartholomew's Hospital. London: H. K. Lewis and Co., Ltd. 1930. Pp. 228. 12*s*. 6*d*.

THIS book, which is intended to bridge the gap which exists between anatomy and surgery, is essentially a book on anatomy applied to surgical problems, and it is built up on a system which makes it very smooth and pleasant to read. A hypothetical case of some common surgical ailment is described at the beginning of each chapter. The reader is then shown how some of the prominent features of the condition depend upon the original or altered anatomy, and how the problems of restitution to normal may be best carried out from an anatomical standpoint. This is done in an easy armchair style, which is very attractive. Such a work cannot be inclusive, but the student is likely to gain more from this book than from many a complete systematic treatise on applied anatomy because his interest will be retained. Numerous illustrations are provided which, though not of high artistic merit, explain very clearly the meaning of the text and enhance the value of the book.

Chill, its Dangers and Prevention.

By MARIAN THORNETT, F.R.C.S.I. London: J. and A. Churchill. 1931. Pp. 194. 3*s*. 6*d*.

IN a foreword to this book, Dr. Jane Walker points out that a cool, dry skin is able to keep the body at an unvarying, comfortable temperature, and claims that by interfering with this physiological equilibration the use of woollen garments for children "has been fraught with ultimate evil for countless millions of people." The subject matter of the book is an elaboration of this theme, the chapters dealing with such subjects as the standard of national health, the action of chill in lowering vitality, the production of body heat, the skin and its care, clothing in general and clothing for children, baths and exercises, relationship between altitude and chill, diseases often produced by chill, psychology of the fear of cold, and "hardening."

Dr. Thornett's iconoclastic attack on our civilisation is not confined to our methods of clothing ourselves and our young, and, indeed, it is obvious that our ways of living must be revolutionised if the skin is to exercise its functions to their full extent. Some of the evidence here adduced, however, is scarcely adequate to support her contentions. The Army and Navy recruiting figures for 1913 and recent years would require much closer scrutiny before they would justify the conclusion that our physique is deteriorating, and surely everyone is aware of the fallacies to be avoided in interpreting the Health Insurance records of recent years. That "a cold is always the result of chill," and "at least one-third, and in all probability more than that, of the illnesses which end fatally are preceded by chill, while perhaps 50 per cent. of the illnesses from which we recover are due to the same cause, directly or indirectly," are statements which, we think, are not substantiated by any accurately ascertained facts. While this book shows evidence of much thought and great enthusiasm, it would have been more convincing if less bias had been shown in the analysis of some of the data put forward. Nevertheless, while it is hardly correct to say that "the effect of clothing on the body has never been investigated," Dr. Thornett's book will have done good if it leads to a greater interest in the subject and to a scientific inquiry into it.

Among the Thinkers: Leaves from My Note-books.

BY J. A. LINDSAY, M.A., M.D., F.R.C.P. London: H. K. Lewis and Co., Ltd. 1931. Pp. 198. 5*s.*

PROF. Lindsay's little book of quotations makes a generous well of worldly wisdom into which one may dip anywhere and bring up a well-turned phrase, an acute observation, or a profound reflection. Inevitably one skims such an anthology seeking a revelation of the character and personality of the collector. The impression is of a man, sane, kindly, dignified, tolerant, English rather than the acrid Scottish flavour to be expected from the author's patronymic. The quotations from Anatole France give a welcome spurt of ironic colour and suggest that another facet of Dr. Lindsay's mind would modify this impression.

Introduction to Medical Biometry and Statistics.

Second edition. By RAYMOND PEARL, Professor of Biology, School of Hygiene, Johns Hopkins University. London: W. B. Saunders Co., Ltd. 1930. Pp. 459. 25*s.*

NOT many text-books on statistics have been specifically written for the benefit of the medical man. Many of us can recall our own introduction to the subject in the short, sometimes unintelligible and even inaccurate remarks on birth- and death-rates, standardisation, estimation of intercensal populations, and perhaps on life tables, which are commonly relegated to the concluding pages of manuals of hygiene and public health. The medical man with slight mathematical equipment has found somewhat indigestible the fare provided in general and special text-books of statistical theory and method, and in the past has shown little enthusiasm for this branch of knowledge. An elementary knowledge of statistics is, however, almost essential to those who wish to draw valid conclusions from the clinical material they have collected. Prof. Pearl is prepared to pilot the tyro through some of the initial difficulties, and in so doing illustrates the applicability to everyday problems of the more common and useful biometric methods.

In the second edition his book has been largely rewritten and enlarged; perhaps the most important additions are the more detailed consideration given to the methods of collecting, and the essential ideals in making scientific records, and the chapter dealing with the logistic curve. Beginning with historical and introductory matter, the author deals in logical sequence with the collection of the basic data, their tabulation, presentation, and methods of analysis. The field covered includes all that is required for the successful handling of medical investigation—rates, ratios, life tables, averages, measurement of variation and correlation, simple curve fitting, elementary theory of probability, and that mysterious appendage to statistical constants, the probable error. The mathematical details supplied are few, and they are, moreover, presented in a manner intelligible to any medical reader. The bibliography appended to each chapter is carefully chosen and sufficiently extensive, and the discussion of methods is frequently interspersed with allusions to current medical and biological problems.

The new edition can be recommended to physicians who feel the need of guidance in the compilation and analysis of their records, and we trust that more and more of them are becoming conscious of this need.

Der Appendicitische Anfall.

By LUDWIG ASCHOFF. Berlin: Julius Springer. 1930. Pp. 125. R.M.12.40.

THIS monograph embodies those researches of Ludwig Aschoff which were designed to elucidate the problem of the infecting organism in acute appendicitis. Amongst the host of bacterial strains found in the alimentary canal in such cases it is difficult to determine which shall be counted amongst those of ætiological significance. Phagocytosis in an early stage is accepted by the author as the criterion of pathogenicity, and this book is an account of the problem from this standpoint. It is short, easy to read, and has definite value as a contribution to the subject.

Practical Anæsthetics.

For the Student and General Practitioner. Second edition. By C. F. HADFIELD, M.D. London: Baillière, Tindall and Cox. 1931. Pp. 350. With 41 figures. 7*s.* 6*d.*

THIS excellent handbook has been considerably enlarged since its first appearance, chapters having been added on splanchnic, local regional analgesia, and local analgesia in dental practice. The latest methods and drugs come in for due consideration with the exception of the barbiturates which the author thinks not yet sufficiently well established. Dr. Hadfield has wisely omitted large numbers of anæsthetic machines from his pages since these are mostly apparatus only for the use of specialists, whereas this book is eminently suited to the general practitioner. His general advice is sound and his descriptions of methods and of the principles involved are always clear and logical. We note that he predicts the inclusion of nitrous oxide in the next issue of the British Pharmacopœia with due tests and standard of purity, an addition long overdue. We notice, also, in explanation of massive collapse of the lung, that the author attributes this "to some characteristic spasm of the bronchial musculature . . . associated with some disturbance of the sympathetic innervation." He does not mention inhibited action of the diaphragm to which many authorities attribute the lung condition. Dr. Hadfield gives a good deal of space to percaine which he obviously regards as a very valuable addition to the list of local analgesics, particularly for spinal use. His book went to press, of course, before the recent decease (official) of "status lymphaticus," so that condition now generally regarded as mythical still figures in the book as a source of danger to be borne in mind when chloroform is used on children. The printing of this book adds to the pleasure of reading it.

Diseases of the Urinary Tract in Children.

By EDWIN BEER, M.D., and ABRAHAM HYMAN, M.D. London: William Heinemann Ltd. 1930. Pp. 318. 25*s*.

THIS book contains a series of monographs in which the authors present the experience they have acquired in the past 20 years, mainly in the wards of the Mount Sinai Hospital. One of the most interesting sections is a discussion on the surgical treatment of nephritis. The authors consider that decapsulation is of value in the acute type of this disease, and in the chronic type with acute exacerbations, but less so in the more chronic lesions. It is, perhaps, rather confusing to have included perpetual incontinence due to congenital deformities in the chapter headed "Enuresis"; and the section on the treatment of vesical calculi is not convincing. The number of young male children in whom litholapaxy is possible must be small. As a whole the book is interesting and instructive. Illustrative cases and a bibliography are appended to most of the sections, and there are some good illustrations.

Life Movements in Plants.

Edited by Sir JAGADIS CHUNDER BOSE, D.Sc., F.R.S. London: Longmans, Green and Co., Ltd. 1931. Pp. 211. With 80 text figures. 18*s*.

THIS is the sixth volume of the Transactions of the Bose Research Institute in Calcutta, and contains a number of contributions to the physiology of plants by the Director and his pupils. They deal mostly with rhythmic movements, the transmission of stimuli from one part of a plant to another, and the ascent of sap and, as before, are characterised by great refinements in methods of automatic recording and by the idea that the working of plants finds many close analogies in animal mechanisms. Three papers concern the proteolytic enzymes of plants, and it is interesting to note that the results which Prof. S. H. Vines reached 25 years ago are maintained against recent efforts to impugn their accuracy.

Text-book of Inorganic Pharmaceutical Chemistry.

For Students of Pharmacy and Pharmacists. By CHARLES H. ROGERS, D.Sc. (Pharm.), Professor of Pharmaceutical Chemistry in the College of Pharmacy, University of Minnesota. Philadelphia: Lea and Febiger. 1930. Pp. 676. $7.00.

To those in search of historical information or particulars of natural sources, explanations of qualitative or quantitative methods of the pharmacological action of ions, and therapeutic uses of drugs, this book may prove valuable as a reference work. The author states that the elements have been considered in the order in which they occur in natural groups or families, and then proceeds to ignore this plan by beginning with oxygen, hydrogen, nitrogen, taken from Groups 1, 6, and 5, and then proceeding to the halogen family (Group 7), the alkali metals, the coinage metals (sic), deals with the alkaline earth metals, beryllium and magnesium and their compounds, boron aluminium and the metals of Group 3, Group 4, the phosphorus family, and Group 6, in which he includes manganese which, of course, strictly speaking, belongs to Group 7. In itself there is no harm in the arrangement adopted but it does not actually conform to the opening statement. The book contains quite a quantity of information likely to stimulate interest, but it is marred by a certain lack of discrimination; this is illustrated by the tendency to represent by equations reactions which do not merit such treatment, as, for example, the decomposition of sodium acetate on ignition; incidentally the equations (2), (3), and (4) on page 229 do not balance. The book shows other signs of needing revision; on page 27 occurs the statement that the pH drops to neutrality when actually it is the acidity which drops while the pH rises; on page 598, line 17, ferric oxychloride should read ferric chloride. As an example of loose method of expression we may quote the first sentence of the preface in which the term qualitative chemistry is apparently used to imply qualitative analysis. In spite of these faults the book will give useful information about the properties and mode of action of many inorganic substances used in pharmacy to readers who have sufficient knowledge of chemistry to be able to read it with discernment.

Nutrition and Food Chemistry.

By BARNARD S. BRONSON, State College for Teachers, Albany, N.Y. London: Chapman and Hall. 1930. Pp. 467. 18*s*. 6*d*.

ALTHOUGH no inconsiderable part of this manual is directly concerned with the chemistry of foods and foodstuffs, the arrangement of the material is so well planned and its exposition is so clear that scarcely any previous knowledge of chemistry is necessary to enable the argument to be followed. The first part of the book deals with the chemical structure, the intermediary metabolism, and the physiological properties of the constituents of foods, and includes an account of the food and energy requirements of the normal human being. The second part is occupied by a discussion of the nutritive properties of individual common foods, and deals with methods for their production and preservation. Numerous references to recently published work would enable the reader to examine the evidence upon which the conclusions are based. This volume can be recommended strongly to those who wish to understand the fundamental principles underlying the science of nutrition.

A Text-book of Practical Therapeutics.

Twenty-first edition. By HOBART AMORY HARE, B.Sc., M.D., LL.D. Professor of Therapeutics, Materia Medica, and Diagnosis in the Jefferson Medical College of Philadelphia. London: Henry Kimpton. 1930. Pp. 1104. 36*s*.

IN its twenty-first edition this work has been enlarged, thoroughly revised, and largely rewritten, but there is no alteration in its general plan and arrangement. It deals first with general therapeutical considerations, then with the pharmacological action and therapeutical uses of drugs and other remedial agents, and finally discusses the treatment of individual diseases, arranged, not in systems, but in alphabetical order. It contains, in addition, a Therapeutic Index, which should prove a useful means of obtaining quickly suggestive ideas as to treatment. Many of the newer methods of treatment, such as the intravenous use of tartar emetic in the treatment of chancroids, and the employment of irradiated ergosterol in rickets and stomach extracts in pernicious anæmia, are discussed. The author has obviously kept abreast of modern advances in pharmacology and therapeutics, and the book is likely to maintain its deserved popularity.

THE LANCET.

LONDON: SATURDAY, APRIL 11, 1931.

SILICOSIS: INTERNATIONAL RECORDS.

Considerable interest attaches to the account only just published of the proceedings at the International Congress which met in Johannesburg to discuss silicosis in August, 1930.[1] The International Labour Office deserves thanks for organising the congress and for this publication, which must become a standard work of reference. The discussions at each session are reported more or less in detail, and the general conclusions reached as the result of the conference are set forth in the reports of the eleventh and twelfth sittings. These conclusions and recommendations are rather hidden in this position, and, in view of their importance, might have been given prominence at the beginning or end of the volume.

The chief value of the book lies in the series of papers prepared beforehand by various experts for the consideration of the congress, and the value is high. The opening articles deal historically with conditions in the South African gold mines, which led some 30 years ago to the origination of silicosis among the miners, and with the progressive steps taken to combat the disease, which include control of blasting operations to minimise exposure to the dust generated, the use of water-feed drills to prevent the formation of dust during drilling, and improved ventilation to dilute and remove vitiated air. The gold reefs consist of quartz pebbles in a hard siliceous matrix; hence arises silica dust during mining operations. The dust has been determined either gravimetrically by drawing mine air through a column of sugar and then dissolving the sugar in water, from which the dust is filtered and weighed, or by counting the particles caught on a glass microscope slide when air is made to impinge on it. Figures given show a vast improvement in 1929 as compared with the dust in mine air in 1914. Ætiology is well stated; it depends on intensity, duration, and continuity of exposure to phthisis-producing dust; it is favoured by high humidity, which favours infection; infection should be regarded as seriously as in an operating theatre. The sections devoted to pathology, radiology, and symptomatology are particularly useful, and are excellently illustrated; they must for long form the basis of accepted knowledge on the subject. Amid so much that tells of the progressive and fatal nature of silicosis, illustrations of cases, still healthy, 8, 12, and 21 years after being diagnosed as well-marked instances are refreshing. A series of papers tells of the occurrence of silicosis in other countries; in the various States of Australia the disease is mainly concerned with gold mining, just as in South Africa; and in Canada also it has usually taken the form of miners' phthisis, although some granite cutters have been affected. The disease has been more general in Germany, attacking rock drillers, potters, metal grinders, and masons; here recognition has recently been widely given to its importance. The article by Dr. E. L. Middleton describing silicosis in Great Britain is the most thorough of the series, setting out its prevalence in numerous industries, the extension to them of compensation rights, and the adoption of preventive measures; the industries concerned are the refractories, grinding of metals, work on sandstones and granites, slate quarrying and dressing, coal mining, tin mining, pottery, sand blasting, silica milling, flint crushing, millstone dressing, and flint knapping. Interesting facts are also stated with regard to pneumonoconioses in Italy and the Netherlands. The article dealing with the United States, although only a brief summary, displays the disease as widespread, and attracting increasing interest in many industries, while it is also the subject of research work.

This important record closes with explanations of how the Miners' Phthisis Medical Bureau functions at Johannesburg, and of how, by progressive legislation, the disease is being steadily brought under control. As the congress proceeded the importance of the data on all aspects of the silicosis problem which has been accumulated in South Africa became more and more apparent. At the eighth sitting of the conference, on August 20th, Dr. L. G. Irvine, who presided, stated that the figures showed that silicosis was definitely on the decline, especially among new rand miners. Dr. A. J. Orenstein suggested that though the statistics presented by Dr. Irvine and Dr. Spence Fraser were perfectly reliable, they did not reflect the whole picture. It was very difficult to visualise all the factors without biological and engineering knowledge. Prof. A. J. Hall and Prof. E. H. Kettle supported his plea for an even wider and more searching survey of the unique material collected in South Africa from a biometrical basis. So many factors are concerned in the problem that the analysis of the figures is a matter of extreme difficulty. It may be hoped that at least one result of the conference will be an investigation of this kind, since the statistics of South Africa are of the utmost importance to all countries which have to initiate legislation in connexion with silicosis.

MEDICAL BENEVOLENCE.

No man knows with certainty what awaits him in the future, but to one section of the medical profession the future is definitely clouded and dismal. It is this section to which the Royal Medical Benevolent Fund has devoted its attention for the last 95 years. It is probable that in many cases in which relief is sought there has been lack of prudence although, as Dr. C. O. HAWTHORNE remarked at the recent annual meeting of the Fund, the lack is not necessarily on the part of the applicant. In any case, he added, the position is not to be met by the critical examination of the economist or of the moralist but by the generous judgment and help of those who are more fortunate. The Fund offers relief over a wide range of circumstances. It helps one practitioner who, as the result of illness or accident, finds himself unfit for work and in danger of destitution ; it helps another who, by age or misfortune, has been reduced to penury or helplessness ; it helps the widow of the medical man who has been left almost penniless ; it helps the elderly daughters of a deceased practitioner who by age, incapacity, or illness are no longer able to earn a livelihood ; it helps to educate or to find work for the members of a deceased practitioner's family ; and it helps by an immediate grant to solve an acute emergency in a practitioner's fortunes. These aims need no support from us, but it is true now as it always has been that examples of individual misfortune make stronger appeal than the recital of group sufferings. Two cases helped by the Fund during recent months are these :

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[1] Silicosis. Records of the *International Conference* held at Johannesburg, August 13th–27th, 1930. International Labour Office. Studies and Reports. Series F (Industrial Hygiene), No. 13. Geneva. Pp. 692. 1930.

(1) A doctor, aged 76, has been bedrid for the last two years following a stroke. He is now quite childish and unable to look after himself. His two sisters are entirely dependent on him ; the elder is confined to bed with cancer of the bowels, the other, about 60 years of age, is very frail and alone looks after these two invalids. She cannot afford a servant or nurse to help her, and has to do all the housework and nursing herself. There is only £110 a year for these three to live on. The Fund voted its maximum grant of £40.

(2) A doctor's widow, aged 65, has since the death of her husband been entirely dependent on her eldest daughter for support. The daughter, who was making a success in her profession as an actress, died after a short illness from pulmonary tuberculosis, leaving her mother penniless. Other charities contributed £55. The Fund voted £36.

Apart from cases like these there is on the books of the Fund a long list of widows of medical men who have no other income than the old-age pension of £26 a year. If it were not for grants of £26 from the Fund, or annuities of £36 which are available for some of them, they would have to submit to the ignominy of seeking outdoor relief.

The amount of distress among the members of our profession seems to be still but faintly realised. Last year 661 grants amounting to nearly £10,000 were made in all : 331 of these were maintenance grants, 16 educational grants, 27 assistance in time of illness, 43 were made for specific purposes, 24 emergency grants in temporary difficulties. The total number of annuitants is 177, and largely as a result of the legacy of the late Dr. ALEXANDER LAWRENCE there are five persons receiving pensions each of £100 a year. The total expenditure on grants has been nearly £1000 more than during the previous year owing to an increase in income from the accession of 584 new subscribers, the revenue from subscriptions and donations for the first time reaching five figures. Of these, 223 came through the British Medical Association which collected £1970 for the Fund during the year. A special appeal to medical societies and panel committees yielded a response from 23, bringing the total number supporting the Fund to 86. A donation of £630 was received from the Medical Insurance Agency. Sir THOMAS BARLOW, President of the Fund, described the reports of honorary secretaries and honorary treasurer as eminently satisfactory, noting that the Fund had made definite progress during the year in securing the support of the profession. While no doubt in these hard times any increase in benevolence must be regarded with satisfaction, the position is hardly to be regarded with complacency in which 55,291 registered practitioners raise among themselves the sum of £10,082 in the course of the year. The amount is precisely 3*s.* 7*d.* a head. A subscription from each of one guinea a year would enable the Fund to assist adequately all who apply for help.

The trouble of the Royal Medical Benevolent Fund is the number and variety of the claims made upon it. To some extent the Fund is able to act as a clearing-house for other charities, and there is sound reason why it should not be calle upon when help is available elsewhere. Probably the most distressing kind of case which comes before its officials is that of the young medical man who has died early in his career, before having made provision for his wife and young children. For this particular kind of risk there is in the London area an established and endowed agency known as the Society for Relief of Widows and Orphans of Medical Men. By payment of an annual subscription of two guineas a newly married man gets the satisfaction of knowing that his wife will receive support and his children education in the event of his early death ; such protection would cost him many times as much at a life assurance office. There are many directions in which a young practitioner needs to safeguard himself, and although no doubt some are in a position to cover themselves against all possible risks, there are others who must either unduly postpone marriage or live under a cloud of anxiety in the early years. For such as these, until success in practice enables them to make *provision for* dependants, an annual subscription to the "Widows and Orphans" has a provident character. When success renders the *practitioner's* dependants ineligible for benefits from this society, the subscriptions become of a purely benevolent nature, safeguarding the fund *for others* less fortunate. The society has a long and honourable career o nearly 150 years, and no arrangement would bette meet the domestic anxieties of the young practitioner. Its membership is however limited t those who at the time of application are residen within a radius of 20 miles from Charing Cross though adherence later is not affected by chang of residence. The house officers of all th London hospitals are eligible.

STREPTOCOCCAL INFECTIONS.

THE study of the staphylococcal infections as a group made up the greater part of the *Guy's Hospital Reports* for April, 1930. In the January issue which has lately appeared the streptococcal infections are dealt with in much the same way by nine different observers. Dr. J. A. RYLE, whose paper opens the symposium, believes that although the symptoms of invasion of the blood stream by the streptococcus are varied they can be collectively considered as manifestations of streptococcal fever. Such a presentation is complicated by the large number of strains of streptococcus capable of causing blood poisoning and the many possible routes of invasion. If surgical injuries are excluded, Dr. RYLE thinks that the most apparent causes predisposing to streptococcal fever are other infections and anæmia. Septicæmia may, of course, originate by invasion of a cutaneous or mucous surface or deeper structures, or without an evident local focus. He finds that four manifestations seem to be peculiar to streptococcal fever due to a hæmolytic strain—namely, frequent and troublesome diarrhœa, albuminuria with red cells and casts, rapidly progressive anæmia, and a smooth, red, desquamated and sore tongue. He bases the diagnosis of streptococcal fever of the septicæmic type on the association of high fever, rigors, quick pulse, delirium or an over-alert mentality, rapid splenic enlargement, and metastatic infection of serous cavities. A lobar pneumonia may complicate a streptococcal invasion, and when such a pneumonia is accompanied by anæmia and is slow to resolve Dr. RYLE finds that lung puncture usually gives a hæmolytic streptococcus. The medium or larger joints, the pleural sacs, the pericardium, the meninges, and the peritoneum are the favourite sites for metastatic abscesses, although a streptococcal septicæmia may run its course to death or recovery without metastatic symptoms. As regards prognosis Dr. RYLE believes that those patients who survive the first onslaught and weather the first fortnight have a fair prospect of recovery, even when high pyrexia continues and complications ensue; other points in favour of a good prognosis are a surgically accessible focus of invasion, a high leucocytosis, and metastatic localisations which are amenable to surgical treatment. Unfavourable localisations are those involving the meninges or the pericardium. A careful watch for the development of localised infection, in order that aspiration or drainage may be undertaken early, is an important element in the treatment of these infections; when blood cultures become negative but the temperature remains high, the search for metastases must be pursued with special care. Otherwise the treatment should include good nursing, a copious fluid intake, morphine for pain, and immobilisation of affected joints. There is no sound evidence, Dr. RYLE says, that chemical antiseptics by the intravenous route do good, and the value of antistreptococcal serum is also open to debate. To be given its best chance the serum therapy must be begun early, within the first 48 hours, and in adequate dosage; it should not be continued blindly if no improvement follows the first few doses. It is perhaps unfortunate that Dr. RYLE does not make clear, in the 21 case-histories which he quotes, on which day of illness blood cultures were taken. The diagnosis of septicæmia presents many difficulties, and is often only clinched by the discovery of bacteria in the blood; it would be useful to know at which point in the cases quoted this confirmation became available. Apparently, a positive blood culture cannot be obtained early enough to determine the use of serum if this is to be given during the first 48 hours; serum therapy should therefore be undertaken on the strength of a diagnosis based on symptoms.

Writing on streptococcal puerperal sepsis Mr. G. F. GIBBERD quotes the work of COLEBROOK, BURT-WHITE, and others who have found that among non-fatal cases infection by a hæmolytic streptococcus alone occurs in only 8 to 30 per cent. of cases. Of the fatal cases the majority are due to *S. pyogenes*, but *S. viridans* and non-hæmolytic streptococci and a group of anaerobic streptococci may also be responsible in a few cases, Mr. GIBBERD considers. Since the vulval skin cannot be excluded as a source of infection, he believes that the use of antiseptic lotions still has a place in midwifery and should not be discarded as valueless. He urges the importance of wearing a mask when attending a confinement, a simple precaution which has been generally neglected. Recent investigations show that the throat of the attendant has sometimes been the source of the streptococci which killed the patient. Since fatigue and acute anæmia play a part in the incidence of sepsis, Mr. GIBBERD advises blood transfusion in all cases of severe hæmorrhage, preferably before the patient shows signs of infection. The method, introduced by REMINGTON HOBBS, of instillation of glycerin to promote drainage of the uterus, has suffered, in Mr. GIBBERD'S view, from too little insistence on the technique to be employed; glycerin introduced with bad technique may do more harm than good. He recommends anti-scarlatinal serum early in the disease, but deprecates the pious hope of a blunderbuss action which inspires the injection of antistreptococcal serum.

Mr. T. B. LAYTON is able to state that there is no particular clinical type of acute mastoiditis due to the hæmolytic streptococcus. He believes that useful information would be obtained by the routine culture of bone from cases of acute mastoiditis. In chronic mastoid disease he points out that it would be valuable to know at what point the primary organism, usually a hæmolytic streptococcus, is killed off and the bone becomes sterile, and the subsequent point at which secondary infection of the abscess develops. A paper on streptococcal diseases of the skin is contributed to the symposium by Dr. H. W. BARBER; and Dr. L. FORMAN writes on the value of intradermal tests with *S. hæmolyticus*, *S. viridans*, and staphylococcal vaccines in cases of erythema multiforme and lupus erythematosus. Successful treatment by intradermal vaccination has been recorded in two cases of erythema multiforme. Dr. F. A. **Knott** gives a survey of the streptococcal types and their significance in clinical medicine, and acute streptococcal infections of the throat are discussed by Mr. W. M. **Mollison**. Dr. **Arthur Bulleid** contributes a bacteriological study of the apical infection of teeth, and a remarkable case of streptococcal septicæmia with peritoneal localisation is described by Mr. **Philip Turner**.

ANNOTATIONS

THE TRAFFIC IN DANGEROUS DRUGS.

Reports of the fourteenth session of the advisory committee on the traffic in opium and of the seventh session of the Permanent Central Opium Board are full of interesting, but not very reassuring, information about the licit and illicit commerce in "dangerous drugs." There are still many States which have not yet ratified the Geneva Convention of 1925, including four which are members of the Council of the League. The illicit traffic in 1926–29 was on an even more considerable scale than was suspected. Apparently some 21 tons of morphine and heroin were exported to non-manufacturing countries in excess of medical needs, and about 15 additional tons of these drugs, statistically unaccounted for, passed into illicit traffic in the five years under review. Moreover, six tons of benzoyl-morphine, hitherto an unscheduled drug, passed in 1928 through the single port of Dairen, an amount which represents 600,000,000 doses. Large seizures have been made of cocaine smuggled into India, mostly of Japanese origin, while considerable quantities of contraband Persian opium find their way into China. It is lamented that four out of the six chief opium-producing countries—viz., Turkey, Persia, Russia, and China—are at present outside the Geneva Convention, and attention is drawn to the fact that States which are parties to the Geneva or the Hague Conventions have failed to follow up the ratifications by legislation on the lines of the Dangerous Drugs Acts 1920–25 of Great Britain.

If we turn to the report of the Permanent Central Opium Board, which deals with the statistics for 1929, we learn that the returns received from several countries are incomplete; this is so even in the case of France, while from southern and central America there is an almost entire lack of information. As Peru and Bolivia are among the chief producers of coca leaves such absence of information is regrettable. Owing to the conversion of morphine into substances not covered by the Conventions it is inferred that in 1929 12 tons of morphine were manufactured in excess of that required for legitimate purposes throughout the world. There are strange discrepancies in regard to the consumption of cocaine and heroin in different countries. Thus the Australian consumption of cocaine is double that of other Anglo-Saxon countries, and, while in France the consumption of heroin is at the rate of 21·6 kg. per million inhabitants, in Anglo-Saxon countries it is only 2·21 kg. The Board is led to the conclusion that drugs are escaping from licit into illicit traffic, but finds that under the Geneva Convention it is unable to obtain such information as to the contraband commerce as will enable it to act with promptitude and efficiency. Moreover, the tables supplied for raw opium show no sort of agreement as to imports and exports. Much is hoped from the new conference on the limitation of traffic in dangerous drugs to be held next month in Geneva. It is somewhat astonishing to learn however from an answer recently given in the House of Commons that "the question of limiting the production of raw opium is outside the scope of the conference." It will be remembered that it was a similar exclusion from consideration of the production of the raw materials of dangerous drugs that was largely responsible for the withdrawal of the American delegation, followed by that of the Chinese, from the Geneva Conference of 1924–25. It will be, to say the least, anomalous if such exclusion is again persisted in.

ALLEVIATION OF PAIN IN CHILDBIRTH.

If ever there is a serious endeavour to supply anæsthesia during labour for all women who desire it, the main problem in England will be how to arrange for the 60 per cent. of confinements that are conducted by midwives. There can never, we imagine, be any question of putting the administration of true anæsthetics into the hands of these women, unless their training develops into something far in advance of its present state. It is possible, however, that some form of sedative might be contrived which could be prescribed by the doctor and administered by the midwife, and which might be an effectual means of diminishing or abolishing the pains of labour without interfering with its progress. A possibility of this kind is forcibly brought to mind by the practice described by Prof. H. Sellheim,[1] who discusses the difference between twilight sleep and pain alleviation. He recommends a mixture composed of half the maximum dose of omnopon, and half the maximum dose of scopolamine, given in brandy and syrup by the mouth about half an hour before the birth of the head is expected. This administration can, he says, be safely entrusted to the midwife, and is effective in relieving the worst pains of labour. Obviously there may be a great deal of pain endured before the correct time arrives for the dose, but this practice looks to us like a definite step in the right direction.

RELAPSES IN SCARLET FEVER.

Dr. A. Lichtenstein,[2] director of the Epidemic Hospital at Stockholm, defines a relapse in scarlet fever—which was first described by Körner in 1875—as the reappearance during the course of the disease of its principal symptoms, especially the eruption, in which it is possible to produce a Schultz-Charlton extinction reaction with convalescent serum or scarlatinal antitoxin. The frequency of relapses varies according to different observers, but usually ranges within the narrow limits of 0·5 and 1·0 per cent. Up to 1925 the percentage of relapses in scarlet fever at the Stockholm hospital was 0·5 to 0·6 annually. Since that date, however, there has been a striking increase in their frequency, amounting to as much as 10 per cent. in 1929. Lichtenstein is inclined to attribute this increase to the remarkable mildness of the disease in recent years, which results in the immunity produced by the attack being less complete than usual. Unlike A. H. G. Burton and A. R. Balmain,[3] he found that cases treated with scarlet fever antitoxin showed a lower proportion of relapses than those not so treated; of 578 cases treated with antitoxin between 1926 and 1929, only 6·2 per cent. developed relapses, as compared with 9·3 per cent. among 1462 controls. The same was true to a still greater extent of cases treated with convalescent serum. Between 1916 and 1929, 761 scarlet fever patients were given convalescent serum, and only 0·8 per cent. had relapses, as compared with 12,860 controls during the same period, of whom 1·7 per cent. relapsed. In Lichtenstein's experience children between the ages of 5 and 10 years were more likely to develop relapses than adults. The relapse, he says, may appear at any stage of the disease, but is commonest in the third or fourth weeks. As a rule it is mild in character, but occasionally it is severe, and in four cases observed at the Stockholm hospital it ended fatally. As regards the cause of the relapse the question whether it is endogenous, as Lichtenstein maintains, or exogenous, is still unsettled. G. Fanconi, who supports the theory of exogenous reinfection, states that the problem can only be solved by comparing the course of scarlet fever in patients treated in separate rooms and in large wards. No such investigation, however, has yet been made. In a recent communication Burton and Balmain,[4] who as already stated found that antitoxin treatment increased the frequency of relapses, maintain that this tendency to relapses can be prevented by Dick-testing the convalescents and separating the positive reactors from the other patients—clear convalescent patients being removed to a convalescent ward from which they are discharged three weeks after admission to hospital, while patients with nasal, aural, or purulent discharge should be treated by the barrier or bed-isolation method—and lastly by keeping patients in the open air as far as possible.

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[1] See THE LANCET, Jan. 3rd, p. 47.
[2] Acta Pædiat., March 15th, p. 379.
[3] THE LANCET, 1928, i., 1060.

STERILITY OF CATGUT.

NEARLY all surgeons will agree that on the whole catgut is the best substance of which to make ligatures and buried sutures. It is true that catgut ligatures are liable to slip occasionally, but care will guard against this happening. Their most valuable quality is that they can be wholly absorbed, and thus the permanent presence of a foreign body is obviated. They have, however, one great disadvantage—namely, that in the crude state catgut is the seat of a large number of micro-organisms, and certain difficulties are encountered in the endeavour to remove these completely. From its chemical constitution catgut cannot be boiled; the temperature necessary for sterilisation in this way will destroy the material itself. Other methods, therefore, are constantly being devised, and in our issue of Feb. 14th, for instance, Mr. Arthur Porritt described one which has been successfully employed at St. Mary's Hospital for the last nine years. It consists essentially in the employment of oil of peppermint, as suggested by Captain S. R. Douglas, F.R.S., and the process apparently makes the catgut absolutely sterile without diminishing its tensile strength. Absorption proceeds rapidly with very little reaction or fibrous tissue formation. Another interesting paper on the subject is contributed to the February number of *Surgery, Gynecology, and Obstetrics* by F. L. Meleney and Mabel Chatfield, of New York. They began by studying 174 specimens of "prepared catgut" obtained from 12 surgical clinics or purchased in the open market. The specimens were labelled with the names of 17 different manufacturers or distributors, except eight which bore no labels, and all of them were sealed in glass tubes. Each of the samples was tested for the presence of micro-organisms. Those from ten firms yielded no growth on culture media, but the products of seven firms, and all the unlabelled tubes, showed growths in from 5 to 67 per cent. of the specimens tested. In every instance the germs present were spore-formers only, and no pyogenic cocci were found. The second object of the research being to evolve a standard test of sterility, an attempt was made to produce a culture medium in which anaerobic spore-forming bacilli will grow readily. The medium should be a clear fluid with adequate nutrient substances, and it was found that the most suitable was a meat infusion with peptone and reducing substances such as glucose and gelatin. The tube should be closed with an impermeable material such as vaseline, and before being placed in the medium the catgut should be washed as free as possible from the bactericidal fluid with which it has been sterilised, neutralisation being required if chemicals have been employed in sterilisation. Before the batch is liberated for sale the tubes must be incubated for at least 15 days without any evidence of growth.

MOSQUITO CONTROL IN ENGLAND.

THE risk to life and health from mosquitoes in England is, comparatively speaking, negligible, but as a source of discomfort, as well as of economic loss, they call for close consideration. Although the problem is not fundamentally medical, the latest report of the director of the British Mosquito Control Institute contains much that will interest practitioners and sanitarians as well as entomologists. About a decade ago, when parts of Hayling Island were by all accounts almost uninhabitable owing to the mosquito nuisance, a resident there took up the study of mosquito control as a hobby. At first the work done was mainly or entirely local, but it proved too valuable to remain so, and in 1925 the British Mosquito Control Institute was formed and the present building was erected and equipped. It is the only existing institution entirely devoted to research of this kind. The present report covers nearly two and a half years, and the work is described under three headings—advisory, research, and educational. The first consists in supplying advice by visits of inspection and by correspondence, a prearranged charge including a report on the species of mosquitoes found, and the remedial measures recommended. In one well-known golfing resort a serious mosquito nuisance has been ended by a local scheme on lines suggested by and under the periodical supervision of the Institute. In connexion with this aspect of the work a small illustrated pamphlet ("How to Recognise and Collect Mosquitoes and their Larvæ") has been prepared for inquirers. The research also is described under three heads: first, routine examination of specimens collected by the staff or sent to the laboratory (this might more appropriately come under the heading of advisory work); secondly, many kinds of investigation either arising from laboratory routine or undertaken by request (e.g., testing of larvicides); and thirdly, specified pieces of investigation carried out by science teachers, university students, and others using the Institute equipment and the services of its staff. The instructional work has included that done in connexion with a malaria course for medical officers arranged by the London School of Hygiene and Tropical Medicine, elementary or advanced short courses on mosquito control or research, and casual information given by the staff to visitors to the museum, who have numbered 6551 in the past five and a half years. Photographs and lantern slides are also produced and lectures and demonstrations are given at scientific meetings. No detailed account of the work is attempted in the report, but certain items of interest are described. Among these may be mentioned the investigation of a number of females of *Aëdes cinereus* from the neighbourhood of Birmingham which were infested with larval hydrachnid mites, and a study of the habits of *Culex pipiens* by a zoology student of Cambridge University. An account is given of modifications and developments in the special apparatus originally designed by the Director in 1923 for ordinary and stereoscopic photography of insects, and a chart is reproduced which gives particulars of larvæ collected on Hayling Island.

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[4] Medical Officer, Feb. 7th.

COST OF MEDICAL EDUCATION IN AMERICA.

It is generally reckoned in this country that it costs round about £1000 to obtain a medical degree, without, of course, counting the money that the student might be earning during his five or six years' education. The figure naturally varies with the amount of hardship which he is prepared to endure and with the fees and extras of the particular college which he selects. It is interesting to compare this rough popular estimate with a careful investigation of the costs of medical education in the United States which was published recently by Dr. R. G. Leland.[1] He finds that the average annual sum spent by the student is $1100, this being an increase of $200 a year on the figure for 1920. At the lowest possible estimate, therefore, a medical education must cost at least $5000, and if all the factors, such as pre-medical education, expenses during post-graduate education and loss of potential income from other professions, are taken into consideration the actual cash cost may be more nearly $10,000. The information was obtained by giving expense-books to students and asking them to keep an account of their expenditure. As a result 1253 books were available, and this was reduced to 1161 when married students and students living at home were subtracted. The number is obviously insufficient for more than guarded conclusions. The fees in American universities differ very considerably —from $66 to $610 a year. The average amount expended for books, instruments, and journals also varied widely, from $67 to $189, and the expense for room and board varied from $272 at the University of Illinois to $569 at Harvard. The highest average total cost was $1716 per annum at Dartmouth Medical School, with Harvard a close second, while the lowest reported was $425 at the University of Wisconsin. Apparently at least half the students find time to earn some money while they are working. There seems to be a gradual increase in expense as the student years go by, except that freshmen pay more for their books and instruments. There also seems to have been a steady increase in expense during recent years; tuition and fees, books and instruments now cost over 50 per cent. more than in 1920. On the other hand, the cost of room, board, and clothing has only risen very slightly, and there is a decided decrease in expenses for recreation.

A corresponding study in this country would be of interest. Medical students here suffer greatly from the lack of facilities for earning money in their spare time, and the length and expense of the curriculum is steadily increasing. In an editorial published in the same issue the *Journal of the American Medical Association* doubts very seriously whether it is a sound trend in human life to postpone maturity more and more. The best conditions for reproduction exist before the age of 30, but no member of a profession nowadays has an economic chance of marriage before that age. The editorial further points out that if the sum represented by the cost of a medical education were properly invested for a young man at the age of 20, he would, by the time he was 50, have an income which would maintain him in comfort for the rest of his life. It is a reasonable question whether the average income of the physician represents a proper economic return on the cost of his education. It is easier to point out the difficulties than to suggest their solution. The *Journal* calls for more actual evidence, such as that offered by Dr. Leland, to take the place of arm-chair philosophy and unpractical ideals.

STEREOSCOPIC RADIOGRAPHY.

MEDICAL opinion in this country is divided on the value of stereoscopy in the diagnosis of chest diseases. The tuberculosis experts who made a tour last summer of institutions in Canada and the United States were struck by the reliance there placed upon stereoscopic radiography, and on their initiative the subject came up for full discussion at the Oxford meeting of the Tuberculosis Association reported elsewhere in our columns. Dr. J. B. Christopherson indicated at the outset that the ordinary radiogram of the thorax is a shadowgraph—a picture of a flat area having two dimensions—and that in order to unravel questions of orientation and of relative depth of structures, or to discover the relative position of different parts of the same structure in the chest, resort must be had to screening or to the study of films taken from different angles. The aim of stereoscopic radiography is to introduce the additional factor of solidity or depth. Binocular vision is stereoscopic vision, and stereoscopic vision might be defined as the direct perception of the relative distances of objects. Until, however, two films can be taken simultaneously the success of a stereoscopic picture of the chest will largely depend on the exact maintenance of immobility during exposure, a period of $3^{1}/_{5}$ seconds with the apparatus in use at Victoria Park Hospital. He had found radiostereoscopy of the chest of special value in four conditions: (1) in artificial pneumothorax, for orientating adhesions; (2) in cases where lipiodol is used for investigation; (3) for locating foreign bodies; and (4) for locating cavities in tuberculous lungs. Unsatisfactory stereoscopic effects in chest cases were due as a rule, he thought, to failure in equipment, which more collaboration between clinician, radiologists, and engineer might be expected to eliminate. Dr. Peter Edwards (Cheshire) admitted that stereoscopy had given him a new interpretation of the value of X ray films in his daily work. His routine was to screen *every chest*, and then to decide whether to take a flat or a stereo film. Eight types he selected for the stereo were: (1) one that revealed very little wrong on the screen; (2) one that revealed a foreign body; (3) one that revealed a hydatid; (4) the doubtful silicotic; (5) the artificial pneumothorax case with adhesions, to decide as to thoracoscopy; (6) cases after injection with lipiodol; (7) cases in which there was encysted fluid; (8) cases in which it was essential to localise the lobe in which there was an abscess or bronchiectasis. Moreover, in the stereo one often found early indication of the development of disease which could only be seen in the flat film months later. With good screening and stereos he thought there would be less need for the thoracoscope. With the apparatus he used both exposures could be taken in 0/20 second. *Dr. L. B. Stott (Papworth)* enumerated various possible sources of error in shadow stereography, such as the fact that minute lateral displacements will produce considerable anteroposterior distortion, and the increase or decrease of the stereoscopic effect according to the different degrees of tissue translucency to X rays. The clinician, he thought, was on safer ground in depending upon conscious deduction from anteroposterior and lateral views rather than running the risk of stereoscopic illusion. Many speakers formed a bridge between these extreme views. It was suggested that the conflict might be due, at least in part, to stereoscopic blindness, unsuspected by those who suffered from it.

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[1] Jour. Amer. Med. Assoc., Feb. 28th, p. 682.

CLOSING THE HOLE IN CASES OF DETACHED RETINA.

The treatment of detached retina by cauterising the hole has been practised by several ophthalmic surgeons in England during the past year. According to its originator, J. Gonin, of Lausanne, nearly all idiopathic detachments—i.e., those not due to disease, trauma, or tumour—are caused by adhesions between vitreous and retina at the site of old patches of choroiditis, usually in the periphery, not far from the ora serrata. When the vitreous contracts it is liable to pull on the retina at these points and the result may be a tear, through which the fluid in the vitreous chamber enters the subretinal space and causes the detachment. If the tear can be located with sufficient accuracy and can be sealed, the channel through which fluid flows is closed, any remaining fluid is absorbed, and the condition is cured. Gonin is convinced that a hole is formed in every case of spontaneous detachment though it may be very difficult to find, and in some cases impossible owing to opacities in the media. If, however, it can be found, and the detachment is recent, he claims that his operation gives a very good chance of cure, though in view of the uncertainty of exact location and the frequent presence of multiple holes it may have to be repeated several times. In cases of long standing the retina may have lost its function and the prognosis for vision is, of course, much worse.

The first essential in preparation for operation is to localise the hole and this is a very laborious and difficult task. After finding it with the ophthalmoscope the exact spot on the sclera which is over it has to be defined. For this there are two indispensable data—first the exact meridian of the globe in which it is situated, and secondly, the exact distance of the spot on this meridian from the corneal margin. To define the meridian indian ink marks are made just outside the corneal margin in the line which is continuous with that joining the hole with the macula. The distance from the corneal margin is found by estimating the distance from the hole to the ora serrata in disc diameters, one disc diameter being reckoned at 1·5 mm. Add to this 8 mm. for the distance from ora serrata to corneal margin, and if your estimations are accurate you have localised your hole. This is all done before the operation. Now, having reflected the conjunctiva at this spot and made a 2 mm. incision with a Graefe knife through sclera and choroid, Gonin introduces a Paquelin cautery heated to white heat in order to seal the lips of the hole. Others have practised a modified procedure, usually with an electric cautery. R. Rubbrecht, of Bruges, makes an incision 4 or 5 mm. long and passes the cautery rapidly along its whole length in order to make more sure of hitting upon the hole.[1] Sir William Lister[2] points out that the cautery, when once in the subretinal fluid, can no longer retain its heat, and considers it safer not to pierce the choroid but to use the cautery to cause an inflammatory focus in it at the spot opposite the hole, in the hope that the margin of the tear may become adherent to it. Instead of puncturing the sclerotic with a Graefe knife he prefers to make a hole gradually by burning with the galvano-cautery which will block up any vessels which may be divided. Mr. G. W. Black[3] describes the procedure as now carried out at Moorfields Hospital.

> The sclera may be first pierced by a knife, and the interretinal fluid allowed to escape, or the passage through it may be effected by the cautery. The electric cautery with a point of 1 mm. diameter, is used white-hot, and after piercing the sclera it is withdrawn to allow it to recover its heat and then plunged rapidly in and out again to produce scarring of the retina.

Gonin's procedure, however, is apparently unchanged. He lays stress *on the importance of the after-treatment.* The patient is put to bed for a week with his head in such a position that the weight of the vitreous tends to keep the hole closed. If the hole is in the lower part of the fundus the patient may be allowed to sit in an arm-chair a few days after operation. An ophthalmoscopic examination should not be made before the expiration of five days. If not successful the first time the operation may have to be repeated in about a fortnight. Gonin has made as many as six thermo-punctures on the same eye before obtaining a cure, but as a rule one or two suffice. A case was recently shown at the Royal Society of Medicine by Mr. Humphrey Neame where three unsuccessful attempts to close the hole were followed by a fourth successful one with restoration of vision.

Gonin claims to have obtained definite cures in about 60 per cent. of his recent cases, this percentage diminishing with the age of the detachment. Although it is undesirable to encourage hopes doomed to disappointment in the case of old detachments the experience already gained may justify the belief that this operation, or some modification of it, marks a distinct advance in the treatment of this distressing disease. This belief might be considerably strengthened if it were possible to publish details of the condition of patients who had been operated on not less than a year ago. We note that Mr. C. Shapland will read to the Oxford Congress of Ophthalmological Societies later on this month an analysis of 100 cases treated by cautery puncture.

DIPHTHERIA IMMUNISATION.

Our potential control over diphtheria proceeds apace; our actual control will presumably follow in due course. Schick-testing and deliberate immunisation with toxin opened up the possibility of a population made artificially resistant. The use of toxin itself led to some inconvenience and a few disasters, and the discovery that it could be made non-poisonous without losing its immunising power by treatment with dilute formalin was a step of first-rate hygienic importance; this "toxoid" or "anatoxin" is now in general use. Further improvements have lately been introduced by A. T. Glenny and his colleagues[4] at the Wellcome Laboratories at Beckenham. They have found that the active antigenic agent in a solution of toxoid may be precipitated and purified by the addition of potash alum, and that this alum precipitate is decidedly more effective than untreated toxoid in immunisation. The precipitate, for instance, may contain 81 per cent. of the toxoid in the solution, and only 11 per cent. of the total nitrogen, a purification of about seven times. With larger amounts of alum less toxoid is precipitated, but the purification may be as much as 30 times. Tested on animals either experimentally or in the course of the production of therapeutic sera, these alum precipitates make exceptionally good antigens. This appears to be because they are relatively insoluble and remain at the site of injection for a long time, whereas ordinary toxoid in solution is quickly eliminated from the body. In an elegant experiment two lots of guinea-pigs were inoculated intracutaneously, the one with toxoid, the other with alum toxoid. After three days pieces of skin, including the sites of injection, were excised and injected into normal guinea-pigs. The animals receiving the alum toxoid skin became immune, but not those which had the toxoid skin. The facts afford another illustration of the fundamental importance of successive stimulation in immunisation. A primary dose gives the animal experience and, if it effects little by itself, puts it in a position to respond more abundantly to a second dose. Alum toxoid is so insoluble that the animal acquires the necessary training *before* the original dose has been used up. A single dose, therefore, [illegible] may be expected to do as much as two doses of soluble toxoid—plainly a great gain in dealing with the wholesale immunisation of children.

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[1] Brit. Jour. Ophthal., 1930, xiv., 359.

[2] Trans. Ophthalmol. Soc., 1930, l., 545.

[3] Middlesex Hospital Journal, March, 1931.

[4] Jour. Path. and Bact., 1931, xxxiv., 131 and 267.

THE LONDON HOSPITAL SERVICE.

It was a happy thought on the part of the promoters of the King's Fund to get together those engaged in many different branches of the hospital service of London, to give them an opportunity to meet each other and to learn each other's points of view. The gathering included representatives of the British Hospitals Association and of its London regional committee, of the Hospital Saturday and Sunday Funds, of the Hospital Saving Association, and of the College of Nursing, as well as of the London County Council. Lord Macmillan, who has acted as chairman of the committee of relations between the voluntary and municipal hospitals in London, remarked that it was a common experience to find, when we come into personal contact with those from whom we have differed at a distance, that we are much more in sympathy with them than we ever suspected. In domestic as in international affairs it was difficult to know where to draw the line between government and liberty, between State control and individual enterprise. Some people, he said, had been foolish enough to say that the passing of the Local Government Act of 1929 sounded the knell of the voluntary system. I do not believe it for a moment, he said amid general applause. The London County Council was far too wise a body not to recognise what a vast asset the voluntary hospitals represent for the community which they govern, and what a burden would be imposed upon them, were they to attempt to supersede the voluntary hospitals. Parliament had made provision for consultation between local authorities and voluntary hospitals and the meetings of the consultative body in London had admittedly been both interesting and helpful. Lord Macmillan concluded by remarking that the voluntary hospital system seemed to answer to a kind of instinct in human nature, and Sir George Hume, an ex-chairman of the London County Council, who followed, said he was as keen as anyone on seeing the voluntary system maintained and encouraged. They were, of course, faced with the need of laboriously putting together an organisation which had been almost lacking; but there must, he said, be consultation at every step, and Section 13 of the Act provided means for the necessary contact. If an example was needed of the Council's attitude, one need only turn to the new Becontree estate near Ilford. Did the London County Council plan there a public hospital at its own expense? No; it was another ex-chairman of the Council who himself took the trouble to organise a new voluntary hospital to be called after King George. The gathering which took place at Mr. Henry Wellcome's invitation in the spacious rooms of the Historical Medical Museum undoubtedly served its immediate purpose of bringing into close touch many different branches of hospital work, and is likely to serve the larger purpos[illegible] reassuring many who have had some anxiety a[illegible] the reality of the proposed coöperation.

The cheap edition of the report of the S[illegible] Committee on Patent Medicines (1914) has been [illegible] of print for some years and, as Mr. Somerville Hast[illegible] elicited from the Treasury representative in [illegible] House of Commons last week, is not likely t[illegible] reprinted. Only the full edition containing proceed[illegible] and evidence is available (H.M. Stationery Of[illegible] [illegible] 7*d.*). We would remind our readers that [illegible] report, along with the text of the 1920 Bill [illegible] printed as a special supplement to THE LANCET of J[illegible] 10th, 1925, of which copies are still available at 2*s.*

In an announcement last week of the proceedin[illegible] of the eighth British Congress of Obstetrics a[illegible] Gynæcology to be held in Glasgow on Wednesd[illegible] April 22nd, and following days, we stated that t[illegible] discussion on the clinical and pathological featu[illegible] of ovarian tumours would be "introduced by Pr[illegible] Blair Bell and Prof. Beckwith Whitehouse from t[illegible] clinical side and Mr. T. G. Stevens from the path[illegible] logical side." Prof. Blair Bell *points out that th[illegible] wording limits him in the discussion to one, th[illegible] clinical, side of the subject, whereas he intends [illegible] deal with both sides.*

THE SERVICES

ROYAL NAVAL VOLUNTEER [illegible] RESERVE.

[illegible]ry, for Haslar Hospital.

Surg. Lt. T. O. Stevenso[illegible] D. R. Hughes to *Victory*, for Haslar Hospital.

Proby. Surg. Sub-Lts [illegible] Reid to *Dorsetshire.*

Surg. Sub-Lt. D. [illegible] and R. G. [illegible] M. Dean to be Surg. Lt.

ROYAL ARMY MEDICAL CORPS.

Capt. [illegible] Boldero resigns his commn. and is granted the rank of Maj.

Capt. [illegible] Y. Eccott to be Maj. (prov.).

TERRITORIAL ARMY.

Lt.-Col. R. Ward to be Bt. Col.

ARMY RESERVE OF OFFICERS.

Lt. G. B. M. Heggs to be Capt.

INDIAN MEDICAL SERVICE.

The undermentioned officers retire: Col. C. C. Murison and Lt.-Col. W. O. Walker.

Lt. P. Shannon to be Capt. (prov.).

Taquid Deen Ahmad (T.C.), Mohammad Jafar, Fateh Mohammad Khan, Dev Datt, Madan Gopal Sainchar, and Saiyad Wasiul Hasan Askari from I.M.S. (T.C.) to be Lts. on Proby.

Manohar Keshav Pandit to be Lt. on Proby.

Lt. C. F. J. Cropper to be Capt.

Col. G. Hutcheson retires.

MODERN TECHNIQUE IN TREATMENT

A Series of Special Articles, contributed by invitation.

CCCXVI.

THE MANAGEMENT OF COLOSTOMY OPENINGS.

It is a great shock to anyone to find that he is obliged to have an artificial opening for the passage of the bowel contents in place of the one provided by nature. But it is quite a mistake to suppose that such an opening will make the patient a permanent invalid, or will prevent him from living an ordinary or active life. Many doctors even seem to be quite unaware of the degree of control over the bowel actions that can be obtained by patients who have a proper modern colostomy opening. They are apt to judge by cases they have seen in the past and especially by cases of inoperable carcinoma treated by colostomy only, often in the last stages of the disease.

Naturally at first, before they have got used to a colostomy, patients are liable to have occasional accidents due to mismanagement; but after a few months, often after a few weeks, they obtain complete confidence, and unexpected actions of the bowel rarely occur except, perhaps, as the result of carelessness. In time they acquire a sense of when the bowel is due to act and have plenty of warning. Many patients who have colostomy openings live very active lives—hunt, play golf, shoot, dance, dine out, travel, and perform all the other activities of a normal person. A little patience and practice are required to learn how best to manage, but once this knowledge is acquired patients should experience little, if any, inconvenience, and no one but themselves and their family need know that they are in any way abnormal.

The following hints for the management of a colostomy opening were written for me by one of my patients who has had such an opening for over four years, and who has, during that period, lived a most active and useful life. I have added to and supplemented his original notes from what other patients have told me, and I think these hints should prove of value to doctors who are consulted by patients with colostomy openings.

Belts and Dressings.

The so-called colostomy belt with a rubber cup is worse than useless—the cup allows a prolapse of the bowel, and the whole arrangement is grossly messy. The best thing is to have a simple, well-fitting abdominal belt for day use and a less stiff one for night. In many cases a shallow cup or flat plate is necessary, but it should not be attached to the belt in any way. The bath belt can be home-made, a strip of thin rubber sheeting about 4 or 5 in. wide, tied with three tapes, or fixed with a catch.

Robinson's cellular wadding (wood wool) is a most perfect absorbent dressing; one roll carefully used may last for ten days or a fortnight. The roll should be cut up into lengths of about 15 in. or more, according to the size of the abdomen, and the cut piece should cover the abdomen. First a graduated pad of this dressing should be placed over the opening and the cut piece laid on and covered with a layer of ordinary cotton-wool; the cotton-wool is to prevent the dressing from fraying. Finally the belt is fastened on. When the dressing is being changed, all the soiled or damp parts should be removed and the remainder kept for redressing. The wood wool can safely be thrown down the lavatory, since it will absorb, but on no account should the cotton-wool be so treated, or it will choke the drains. Cotton-wool should be burnt. When travelling wood wool alone should be used for this reason.

Suggestions for a Normal Day.

On waking up in the morning the patient may, or may not, be conscious of having had an action of the bowels; this probably took place in the early hours. He should not pay any attention to this, but have his *breakfast in bed*; a light breakfast, *hot* tea or coffee, roll and butter, and perhaps an egg and some fish. Then, if he is a smoker, he should smoke and read his paper. In about half an hour he should have the after-breakfast action. The object of having breakfast in bed is to save a dressing. The night belt should then be removed, the excreta cleared away into a pan, a small dry pad and the bath belt applied, and a bath should be taken.

A hot or warm bath is essential, for it is only in this bath that the parts can be thoroughly cleansed. After the patient gets into the bath he should first wash the head, face, and hands, and afterwards the rest of his body; then the belt should be pushed down and the pad removed. The pad should be rinsed and put on one side and all the folds and crevices about the wound very thoroughly cleansed. The pad is then replaced, the belt pulled over again, and the patient gets out of the bath and dries himself. The bath belt and pad are then removed and a dry pad put on and tied across with the day belt.

Normally there should be no further trouble until the dressing is changed again on application of the night belt, but there may be a small action. When changing for dinner, especially if the patient is going out, it is as well for him to look at the dressing and remove any damp or soiled dressings. Whenever the parts are dressed a little powder, such as Johnson and Johnson's "Baby Powder" should be sprinkled on the parts.

Onions in diet may lead to loose actions at odd times. The patient will soon find out for himself what to avoid; fruit with small pips, onions, cream, &c., are generally aperient in action, as also is spinach, and for some people beer and champagne. A capsule of kerol (intestinal) ♏ 3, if taken before breakfast daily, will completely deodorise the excreta.

Diarrhœa.—Should the patient be unfortunate enough to have an attack of real diarrhœa he may have to keep on his back during the attack, and take a dose of the following medicine, repeated in three hours if necessary. One dose is generally enough:—

℞	Bismuth carb.	gr. 40
	Sodii bicarb.	gr. 10
	Tinct. kramer.	dr. ½
	Tinct. camph. co.	♏ 20
	Tinct. card. co.	♏ 20
	Sp. chlorof.	♏ 15
	Aq. menth. pip.	ad oz. 1

Mitte 8 oz.; 1/8th part for a dose.

Where there is *constipation* four or five stewed prunes for dinner will give an action of the bowels about 10 o'clock. Ordinary aperients are rarely necessary.

Most people can keep themselves quite clean and comfortable, and without any fear of accidents, by the foregoing method of management; but a few after a good trial find that the bowel does not act with sufficient regularity. If that is the case the following alternative method of management is recommended. It is the method mainly adopted by working-class patients who have to be at their job early each morning.

Washing-out Method.

After breakfast the patient sits on a chair with a slop-pail or other suitable receptacle between his knees and places a piece of mackintosh so as to drain everything from the colostomy opening into the pail. He then takes a long rubber rectal tube, easily obtained at any chemist, which has been lubricated all over with glycerin or soft soap and passes it into the upper, or business opening. The tube should be pushed in as far as it will go, but on no account should any force be used. After the tube is in place, a piece of wet wool is packed round the tube where it comes through the opening and held firmly in place with the fingers. The free end of the tube is now attached to a douche can or Higginson's syringe, and a water enema of about 2 pints is allowed to flow into the bowel through the tube. This should bring away any excreta that have accumulated in the bowel during the previous 24 hours. If necessary the wash-out can be repeated. The skin round the opening is now cleaned up after removing the tube and dusted with baby powder. The pad and plate are then adjusted and the belt put on. No further action of the bowel should occur until the process is repeated next morning. It is often desirable to wait a few minutes after the wash-out to allow any water to escape before adjusting the pad. Belts with a receptacle for the excreta are often advised by instrument makers, but they are messy and unpleasant and quite unnecessary except in a few very special cases.

If the patient finds the colostomy opening is not behaving as it should, he should consult his doctor or surgeon at once, as he will be able to advise as to what to do. If proper regularity and control cannot be obtained by these methods it is generally due to the colostomy being wrong, badly made, or strictured, and such errors should be corrected by a surgeon.

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SPECIAL ARTICLES

A SURVEY OF THE IMMUNISATION OF CATTLE AGAINST TUBERCULOSIS.

ATTEMPTS to immunise cattle against tuberculosis have been made by many workers and many methods since the end of last century. The reasons for these efforts are obvious; not only would the protection of cattle against infection with the tubercle bacillus be a sound economic proposition in itself, but it would also contribute materially to the task of ensuring a safe tubercle-free milk-supply. For example, over a period of nine years after the war the number of cows found to be tuberculous in the City of London abattoirs is quoted by Savage[1] as 210, or 33 per cent., whilst statistics show that from 5 to 10 per cent. of milk samples taken in various parts of the country contain virulent tubercle bacilli.

The methods of immunising cattle may be divided into four main groups: (*a*) the use of vaccines made from tuberculin, the various split products of the tubercle bacillus and dead bacilli; (*b*) the use of vaccines of living tubercle bacilli of strains other than bovine—e.g., the tubercle bacillus of cold-blooded animals, avian and human strains; (*c*) the use of vaccines of living bacilli of bovine strain; (*d*) the use of vaccines the precise nature of which has not been divulged.

(A) Dead Vaccines.

This group comprises vaccines made from tuberculin, the various split products of the tubercle bacillus and dead bacilli.

(1) TUBERCULIN.

It is surprising that so few attempts were made during the great tuberculin era at the end of last century to use Koch's old tuberculin as a means of immunisation of cattle. The literature contains only a few short records of experiments, and they are too incomplete to be of very great value. To McFadyean[2] belongs the credit of the first attempt. His first case was a heifer which gave a positive tuberculin test shortly after purchase. In all it received 18 injections with tuberculin with doses rising to 20 c.cm., and was then inoculated intravenously with a gland emulsion, rich in tubercle bacilli, from a horse. Subsequent tuberculin tests were either negative or only f positive, and when the animal was killed three mont afterwards no lesions were found at the post-morte examination except a completely calcified tu in a mesenteric gland. Meanwhile two contro experiments with the test gland emulsion from th horse had resulted in the death of the two animal with typical tuberculosis. McFadyean's second ca was a heifer which gave three positive and on indecisive tuberculin reactions to four test doses 1 c.cm. The animal was then inoculated intr venously with material containing tubercle bacilli o proved virulence. After inoculation this animal wa given eight injections of tuberculin in 10 or 20 c.cm doses. These were followed by six injections o virulent tubercle bacilli. A year after the first inoculation with tubercle bacilli the animal died and tuberculous lesions were found post mortem. A high degree of resistance was evidently present in these two animals, but whether natural or acquired is not clear, and the experiments do not appear to have been repeated. Pearson and Gilliland[3] are also reported to have made an unsuccessful attempt to immunise cattle with tuberculin.

Later Calmette and Guérin[4] attempted the immunisation of two young heifers. The first was given two intravenous injections of 10 c.cm. crude tuberculin at ten days' interval. Thirty days after the second inoculation the animal was given a resistance test injection of 3 mg. bovine tubercle bacilli (strain "Nocard"), and 58 days later it died of acute tuberculosis. The second animal was given two intravenous injections of 20 and 50 cg. respectively of tuberculin precipitated by alcohol, with a ten days' interval between the inoculations. A resistance test, the same in amount as that of the first animal, was then given with the same result—a rapidly fatal tuberculosis. The authors considered that the tuberculin had retarded the fatal result in these two instances, but nothing more. Calmette also quotes Rothe and Bierbaum[5] as having had a similar experience.

All these experiments appear to have been made with Koch's old tuberculin. The present writer cannot find any record in the literature of new tuberculin having been used for the immunisation of cattle. In Calmette's opinion tuberculin has no toxic action on the healthy animal body and therefore has little or no effect in raising resistance.

(2) BACILLARY PRODUCTS.

Since the early work of Vaughan and Wheeler[6] and others on the split products of bacillary substance, many attempts have been made to produce vaccines by treating tubercle bacilli with various substances which break up the bacillus. Foremost of these products are those which result from removal of the whole or part of the waxy envelopes. These vaccines are chiefly lipoid substances. Calmette[7] states that bacilli freed from lipoids by appropriate solvents which do not modify the protoplasmic substances too profoundly can be used as antigens, but that in his hands efforts to employ them as vaccines have been failures. In collaboration with Guérin[4] he experimented with a lipoid made by extracting bovine tubercle bacilli first with boiling acetone and then with benzine. A young heifer was injected intravenously on two occasions with ten days' interval with 100 and 200 mg. of the extract emulsified in bile. Thirty days later a resistance test of 3 mg. bovine tubercle bacilli was administered and the animals died of tuberculosis 24 days afterwards. The experiment was repeated with a younger heifer (two months) with a similar result. The authors therefore concluded that this form of vaccination had absolutely no power of protecting cattle against subsequent test inoculation with virulent bacilli.

It must be noted, however, that Vallée[8] had previously obtained more encouraging results with a vaccine of tubercle bacilli which had been desiccated and extracted with petroleum ether by mechanically shaking for 50 hours in a flask containing glass beads, the bacilli thereby losing a large part of their acid-fastness. Four calves of four months old were used, all being vaccinated by the intravenous route. The first two were given 50 mg. on two occasions with a 20 days' interval. They were given an intravenous resistance test dose of 2 mg. virulent bovine bacilli a month later, and when killed two months after this showed only slight tuberculosis at autopsy as compared with the two controls which had received the same dose resistance test. The third calf was given one dose of vaccine of 200 mg., and the fourth one dose of 400 mg. These two were given a resistance test of 15 cg. virulent bovine bacilli by the intestinal route three months later. Both animals together with the controls were killed at the fifth month. The third animal showed tuberculous glandular lesions equivalent in amount to the controls, but the fourth animal had only three small calcified mesenteric glands. Vallée concluded that these results were not sufficiently promising to warrant further use.

(3) VACCINES OF DEAD BACILLI.

In the early days of tuberculosis immunisation numerous attempts at prophylactic vaccination were made with dead bacilli. Some of these early workers reported abscesses following injection (possibly examples of Koch's phenomenon) and even lesions resembling those of active tuberculosis have been recorded. In one series of experiments Calmette[7] succeeded, however, in causing young guinea-pigs to tolerate the ingestion of very large doses of bacilli, and recently Petroff and Stewart[9] have produced a considerable degree of immunity in guinea-pigs by means of dead bacilli. Loeffler[10] and others have also reported encouraging results. The immunity thus produced, however, is not likely to be permanent.

Only a few of these numerous attempts have been applied to cattle. Vallée[8] tested a vaccine of bovine bacilli heated for one minute to 100° C. Three cows and their calves were used and the experiment was conducted on lines precisely similar to those recorded below with iodised bacilli, all being vaccinated by mouth. Some received a resistance test dose by mouth and were killed five months later, others were placed in a contaminated herd. All developed tuberculosis.

Calmette and Guérin[4] prepared for this purpose a vaccine of bovine bacilli heated for 36 minutes at 65° C. A heifer inoculated intravenously with 20 mg. of this vaccine and then given a resistance test dose of 3 mg. bovine bacilli 30 days later was found at autopsy 90 days after the resistance test to have chronic tuberculosis. Discussing this question later Calmette[7] concludes that the results obtained in this way are nothing more than the modification of an acute rapidly fatal miliary tuberculosis into a chronic slowly progressive tuberculosis. He cites Rothe and Bierbaum[5] as having come to similar conclusions. Immunisation has also been attempted with vaccines of tubercle bacilli killed in various ingenious ways. Thus Vallée[8] used bacilli macerated in iodine water. He cultivated bovine tubercle bacilli in glycerin broth for six weeks and then replaced the broth with iodised water (1 in 400) for one hour. Four bovines were inoculated intravenously with the vaccine thus prepared. The first received 200 mg. vaccine with a resistance test of 3 mg. bovine bacilli 30 days later. This vaccinated animal died of tuberculosis. The second animal received the same vaccinating dose and a resistance test dose of 10 cg. bovine bacilli by mouth. When killed 80 days later no naked-eye lesions of tuberculosis were found, whilst the control showed well-marked mesenteric tuberculosis. The third and fourth animals were given 400 mg. iodised bacillary vaccine followed by a resistance test dose of 15 cg. bovine bacilli by mouth. When killed 148 days later they presented tuberculous lesions of mesenteric glands similar to those of the controls. Vallée next tried vaccinating with iodised bacilli by the mouth. Three cows and their calves were given two doses of the vaccine at 60 days' interval, the cows receiving 50 cg. and the calves 20 cg. of the vaccine when two days old. Four months after the second vaccine one cow and its calf were given a resistance test dose of bovine bacilli by mouth, the cow receiving 20 cg. and the calf 10 cg. Five months later they were killed and found to exhibit tuberculous lesions similar to the controls. The other two cows with their calves were placed, together with the necessary controls, in contact with an infected herd. After a year's contact all the animals, vaccinated and controls, reacted to tuberculin, and when slaughtered were found to have recent tuberculous lesions in the lung with calcified mesenteric glands. Thus the vaccine did not offer much hope of success and was apparently abandoned.

Rappin[11] devised a method of vaccination with which he claimed to have obtained good results in a short series of cattle. The vaccine consisted of bacilli which had been desiccated and then treated with 2–3 per cent. sodium fluoride for several days. After being thus treated the bacilli, according to the author, had lost their power of infecting but still retained their toxicity. Finally the bacilli were exposed to the action of a special antituberculosis serum prepared by the author, so that the vaccine as used for inoculation consisted of an emulsion of bacilli in serum. Calmette[7] states that Rappin's vaccine was tried out by a Commission of the French Society of Comparative Pathology which reported unfavourably.

A vaccine prepared by treating tubercle bacilli with urea has also been placed on the market under the name of Tébéan. Perhaps the best known work on this line, however, is that of Deycke and Much, who have made a very large number of experiments with extracts of tubercle bacilli known as partigens, but we are not aware that any of these have been used for immunising cattle.

Nathan Raw prepared a vaccine from a human strain of *B. tuberculosis* given to him by Koch in 1906 and subcultured since that time. For the purpose of immunising calves a vaccine of heated culture was given in two doses, the first when the calf was a week old and the second a week later. In a publication by Raw in 1925[12] it was stated that 200 calves had been vaccinated in this way, but we are not aware that any subsequent statements as to the results have yet been made.

(B) Living Non-Bovine Vaccines.

The second group comprises vaccines of living tubercle bacilli of strains other than bovine.

(1) TUBERCLE BACILLI DERIVED FROM COLD-BLOODED ANIMALS.

A few attempts have been made to immunise with these strains of the tubercle bacillus—e.g., Dieudonné[13]—but without success. In 1912 Friedmann,[14] however, introduced a vaccine which has had a very considerable vogue as an immunising agent both in man and in cattle. Friedmann's vaccine was prepared from a strain of tubercle bacillus isolated from the lungs of a sea turtle with spontaneously acquired tuberculosis. It was found that this turtle tubercle bacillus did not produce progressive tuberculosis in warm-blooded animals, and it was further claimed by the Friedmann school that it had remained stable from the time it was isolated in 1903 to the time when it was introduced as a vaccine in 1912. In other words, it was a *virus fixe*. Unfortunately a spurious form of this vaccine was placed upon the market shortly before the war, and the whole question has been complicated by acrimonious debates and unreliable statistics from various quarters The most reliable statement in this country will be found in the paper read to the Tuberculosis Association by Dr. Franz Nagelschmidt and reported in our columns.[15] The vaccine is sold in sealed phials in three different strengths: (1) very weak, (2) weak, and (3) strong, and it is said to be free from any additions or modifications.

In 1918 Altmann[16] gave the results of successful experiments performed using this vaccine. He vaccinated a herd of cattle belonging to a farmer who had previously lost about six cattle each year from tuberculosis; after the vaccination of 50 cattle there were no more of such fatalities.

A Commission appointed by the German authorities found that the experience of veterinary surgeons with the Friedmann vaccine was favourable, on the whole, with regard to domestic animals, 42 obtaining good results, 22 doubtful results, and only seven definitely unfavourable results.[17]

(2) AVIAN STRAINS OF BACILLI.

The discovery of the fact that after vaccination of calves with tubercle bacilli of human strain the bacilli might persist in the body of the vaccinated animals for a long time and even subsequently be excreted in the milk, led McFadyean, Sheather, Edwards and Minett[18] to try the effect of living avian tubercle bacilli as a vaccine. As the avian bacillus is only very feebly pathogenic for the human being these authors hoped that the persistence of the bacilli would be a much less serious objection to the use of the vaccine than was the case with a vaccine of human bacilli. McFadyean had previously inoculated two cattle with avian bacilli in 1898 and 1899 and afterwards tested their immunity against bacilli of the bovine type, and although there appeared to be some increase of resistance the animals eventually died of tuberculosis. In the subsequent experiments carried out by all four writers avian cultures from the surface growths of a 5 per cent. glycerin broth were used and 10 to 50 mg. of wet bacilli were inoculated intravenously, the animals being at least three to four months old at the time of vaccination. Nothing that occurred in the course of the experiments afforded any support to the view that a change in type of bacillus could take place. Twenty-nine calves in all were inoculated, 17 being vaccinated with avian bacilli, and 12 as a control with human bacilli. The results showed that the human bacilli were superior to the avian as judged by a subsequent test inoculation with bovine bacilli, but left no doubt in the minds of the writers that avian bacilli could increase the resistance to subsequent infection with bovine bacilli. The experiments did not indicate that there was any real advantage in vaccinating a second time after an interval of two or three months, or that larger doses of bacilli provoked a stronger immunity than the smaller. The experiment was not continued sufficiently long to test the question of the excretion of avian bacilli in the milk of vaccinated animals.

(3) HUMAN STRAINS OF BACILLI.

(*a*) *Behring's Bovovaccine.*—In 1902 Emil v. Behring introduced a method vaccinating cattle against *B. tuberculosis* by a method which he called the jennerisation of cattle, but which is generally referred to nowadays as the bovovaccination of Behring. It consisted in inoculating young calves intravenously with two doses of tubercle bacilli of 4 and of 20 milligrammes, dry weight, respectively. The strain used was one of human origin which had been subcultured for six and a half years until its virulence for the guinea-pig was reduced. The bacilli were dried in vacuo, but were still living. In the earlier experiments the two inoculations of the calf were separated by an interval of six weeks, but later this was extended to three months. Some workers found the method useful, others obtained little immunity thereby, whilst others again found that the immunity though obtainable, did not last more than a year. A careful test of the Behring method was made in France in 1904 by the Société de médecine vétérinaire pratique. Twenty-one calves were given two doses of the vaccine with an interval of 90 days. Two years later Vallée and Rossignol, on behalf of the Société, reported that (1) although quite definite resistance to subsequent injection of virulent bovine bacilli was offered by the animals this resistance was soon exhausted; (2) the resistance of the vaccinated animals to tuberculosis naturally acquired from being stabled with infective animals was not very marked and did not last more than a few months. Subsequent experiments undertaken by the Société showed that the bovovaccine issued by Behring's laboratory at Marburg was not of uniform virulence. Calmette,[19] who gives a full summary of the work, suggests that the variable results obtained by *different* workers were probably attributable to this fact.

(*b*) *Klimmer's Vaccine.*—Klimmer (quoted by Calmette[19]) used a mixed vaccine marketed under the name of antiphymatol, which consisted of human tubercle bacilli attenuated by heating at 52–53° C. until they were no longer pathogenic to the guinea-pig, and of human bacilli which had been passed through salamanders until they were no longer pathogenic for mammals. Resistance is said to have been acquired after two months, but by the end of the year it had diminished. Calmette states that the preparation was tried out on cattle in Saxony by Edelmann with unconvincing results.

(*c*) *Heymans' Vaccine.*—Heymans, also quoted by Calmette,[19] introduced a method of vaccinating cattle by inserting subcutaneously a permeable sac containing modified human tubercle bacilli. The Belgian Government appointed a commission to test out this method on a large scale, but the report of the commission was definitely unfavourable. It concluded that Heymans' sac did not protect animals from infection by ingestion or by contact with naturally infected cattle.

(*d*) *Arloing's Vaccine.*—Arloing, by maintaining tubercle bacilli of a human strain in a vegetative condition in the depth of broth cultures—a method recently revived in a somewhat different form by Dreyer and Vollum—and then gradually elevating the cultures to 44–46° C., succeeded in obtaining a relatively benign strain from which he made a vaccine. He administered this vaccine to cattle in two separate intravenous injections. After a test inoculation with a bovine strain he found that 50 per cent. of his vaccinated animals were at autopsy free from lesions, 25 per cent. had circumscribed glandular lesions, and 25 per cent. lesions of similar intensity to controls. The resistance of vaccinated animals to a prolonged natural infection and the duration of the immunity had not been worked out when Arloing died, but Calmette, who records the experiments,[19] suggests that the immunity produced was probably similar to that of other workers—viz., an immunity lasting about a year and then leaving the animals liable to infection.

(*e*) "*Tauruman*" *Vaccine.*—Koch and Schütz[20] prepared a vaccine of attenuated living human bacilli which was marketed under the name of "Tauruman." Weber and Titze, and Schütz and Holland found that one month after inoculation of the vaccine all the organs of the vaccinated animal were virulent for the guinea-pig, whilst Titze also found that if the vaccine had been inoculated intravenously into cows the organisms might be recovered from the milk. He recovered them as long as 16 months after inoculation. Finally, experiments by Weber and Titze showed that cattle which had been inoculated at the age of three weeks had lost all resistance in nine months, and vaccinated animals living with other animals showed very little resistance. Inoculation of Tauruman, however, appeared, according to Calmette, to dull sensitiveness to tuberculin. He notes also that the calves inoculated are liable to contract a fatal pneumonia after inoculation.

(*f*) The *British Royal Commission on Tuberculosis* also made a short series of experiments with a vaccine of living human tubercle bacilli.[21] Sixteen animals were used in the series; 12 received preliminary vaccinations, 10 with bacilli of human origin, and two with bacilli of bovine origin, and were subsequently tested as to their resistance by the subcutaneous inoculation of a large dose (50 mg.) of bovine tubercle bacilli; four were inoculated with 50 mg. of bovine tubercle bacilli alone and served as controls. Of these four controls three died in from 44 to 76 days of severe general tuberculosis; the fourth was killed after 92 days, and showed general progressive tuberculosis. Seven out of the 12 vaccinated animals were killed in good health 90 to 95 days after the resistance test inoculations, and showed for the most part slight and non-progressive lesions of tuberculosis in the internal organs. Two died after 53 and 87 days from some intercurrent disorder, and were also very slightly affected with tuberculosis. Thus nine out of 12 animals had their resistance so far increased by the protective inoculations that 50 mg. of bovine tubercle bacilli were unable to set up in them progressive tuberculosis. Of the three remaining calves one was killed when well after 89 days and showed general tuberculosis, less severe than that in any of the controls, but more extensive than in the seven just referred to, the lesions in the thorax being apparently progressive. The other two died in 36 and 46 days respectively of acute tuberculosis, differing in some important respects from that produced in the controls; although the lungs were severely affected there were only few tuberculous lesions visible in the other organs.

These experiments clearly show that by the inoculation of large doses of living human tubercle bacilli, as well as by the inoculation of small doses of bovine tubercle bacilli, the resistance of a calf can be raised sufficiently to protect it against the inoculation of a dose of bovine tubercle bacilli which has been shown to be capable of setting up severe and fatal tuberculosis in a calf not so protected. They show further that this degree of resistance is not always produced, and that calves which have been vaccinated once, and even twice, with slightly virulent human bacilli, may develop fatal tuberculosis when inoculated with virulent bovine bacilli.

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(*To be continued.*)

OBITUARY

JOHN ANDERSON, M.D., B.Sc.Glasg., M.R.C.P.Lond.

WE regret to announce the death, in his fifty-third year, of Dr. John Anderson, head of the division of tropical medicine at the Henry Lester Institute, Shanghai, which occurred in Shanghai on March 28th, after an operation for appendicitis.

John Anderson was born in 1879 at Galston, Ayrshire, and received his education at the University of Glasgow, where he graduated in arts in 1901, became B.Sc. three years later, and in 1906 took the degrees of M.B., Ch.B. He was thus nearly 28 years of age when he graduated in medicine, but the intervening time had been spent in the study of advanced zoology, a branch of science which he at one time contemplated making his lifework. After qualification he went into general practice at Wallasey, and for the seven years preceding the war he led the life of a busy and successful practitioner, becoming a consultant for the surrounding district. At the outbreak of the war he joined up, receiving a commission as Captain, R.A.M.C., in a Welsh Territorial division, and early in 1915 he found himself in the throes of the struggle at Gallipoli, while he distinguished himself in the shambles of Suvla beach. He was later transferred to Egypt, and served in Sinai and Palestine as surgical specialist to casualty clearing stations, until towards the close of 1917 he qualified as a specialist officer in field laboratory work, in which he was engaged until the end of hostilities. After the armistice he remained for two more years as a general consultant in the army, until, in 1920, he decided to follow the study of tropical medicine as a career.

DR. ANDERSON.

Dr. Manson-Bahr supplies us with the following account of Anderson's life as a student of tropical medicine :—

"In 1920 Anderson turned up in London with an ardent desire to specialise in tropical medicine, and undertook a course of study at the London School of Hygiene and Tropical Medicine. In the following year, as Wandsworth Scholar, he accompanied Prof. R. T. Leiper to British Guiana on an intensive research on filariasis, and stayed there nearly a year. He was responsible for the able memoir of that research (Memoir No. 7, London School of Tropical Medicine), and showed a quite unsuspected talent in executing the fine drawings with which it is illustrated. Shortly after the publication of the Memoir, in 1924, he was appointed professor of medicine in Hong-Kong. There he soon showed the stuff he was made of. He completely reorganised and directed the teaching of medicine, and has left an indelible stamp on the medical education of that Crown Colony. At the same time he was in demand as a consultant in the town, and was widely beloved and respected both by the Chinese and the Europeans. In 1929 he resigned his medical chair to organise the Henry Lester Institute of Medicine, Shanghai, for which a sum of over one million sterling had been bequeathed. He spent a busy year in England organising the work and planning the Institute, and did not arrive in Shanghai until late in 1930. He was engaged in intensive research in the local diseases at the time of his death.

"John Anderson will long be remembered by his friends for his self-effacing courage, for his devotion to duty, his kindly, quiet sympathetic manner, and for his peculiar talent for getting the best out of all kinds of men. In China this was an asset without price, for he made a lasting impression upon the mind of every Chinaman he came in contact with. During the war he is known to have performed deeds of valour which received no official recognition—for instance, during a raid on a casualty clearing station at Belah, Palestine, in July, 1917, he remained operating on a patient when a bomb exploded on the tent. His former colleagues at the London School of Hygiene and Tropical Medicine mourn his loss as a sincere student, and one with whom it was hoped that closer contact would have been established in the near future."

WILLIAM CARMICHAEL McINTOSH, M.D., LL.D. Edin., F.R.S.,

EMERITUS PROFESSOR OF NATURAL HISTORY IN THE UNIVERSITY OF ST. ANDREWS.

Prof. McIntosh, the doyen of medical zoologist of Scotland, possibly of Britain, who died at hi residence at St. Andrews in the ninety-third year o his age, was well known among scientists throughou the world for his work in marine biology.

Born at St. Andrews on Oct. 10th, 1838, McIntos was educated at Madras College in that city and th University, before entering the University of Edinburgh, where he graduated in 1860, obtaining a g medal for a thesis on Observations and Experimen on the Shore Crab. Although his bent was early declared, he entered upon asylum practice, from 1860 to 1863 was assistant physician at Murray Royal Asylum, Perth, when he was elected superintendent of Murthly Asylum. During th period he found time to pursue zoological studies and in 1869 was awarded the Neill gold medal of th Royal Society of Edinburgh for investigatio chiefly in the subject of marine biology. In 1882 was unanimously appointed to the chair of na history at St. Andrew's University, and in the following year made a report for the Royal Commission o Trawling which brought him considerable credi His name, however, will be best remembered throug the natural history museum of his University and h connexion with the Gatty Marine Laboratory, the fi marine laboratory in Britain, of which he was directo He was not a voluminous writer and his outp dealt wholly with his own subjects.

Prof. McIntosh, who was unmarried, was abstainer from alcohol and tobacco, and pr his physical and mental activity until the close his long life ; in spite of his advanced age, some thr weeks ago he undertook a railway journey to Lond to attend a scientific meeting, and it was a chill caught on the return journey which developed into pneumonia and caused his death.

SPENCER STAWELL CROSSE, *M.C.*, M.R.C.S.Eng.

Dr. Spencer Crosse, who died at Kudat, British North Borneo, on Feb. 10th, was the third son of the late Rev. Edward Albert Crosse, and was born at Long Wittenham, Berks, in 1888. He was educated at Clifton College and at Pembroke College, Cambridge, completing his medical curriculum at Guy's Hospital. He took his B.A. in 1909, and qualified as M.R.C.S. in 1912. After serving as house surgeon and house physician at the Royal Berkshire Hospital, he joined the Royal Army Medical Corps in the first week of the war. During the greater part of the war he was on active service in France, chiefly with field ambulances or at casualty clearing stations, and received the Military Cross. At the close of the war he remained in the army for another six years, and was stationed in India for the greater part of this period. On leaving the army he held various posts as medical officer in the tropics, on the Gold Coast, in British Guiana, and Borneo. He took the Diploma of Tropical Medicine in 1928, shortly before sailing for Borneo on his last appointment.

A colleague writes: "A straight man in all his dealings, Spencer Crosse was greatly beloved by all who knew him. Of an easy-going temperament, he took the ups and downs of life in a true philosophical spirit. He was kind and tolerant, and always endeavoured to put the best interpretation on the actions of others. He was never pushful, according to modern ideas, and, though he had brains above the average, he preferred to exercise them in what immediately lay before him."

JOHN EDWARD THOMAS, M.D. Edin., J.P.

Dr. J. E. Thomas, who died at his home Nantlys, Bangor, on March 24th, was one of the best known practitioners in North Wales. The second son of the late Mr. W. Thomas, of Plas Newydd, near Holywell, he was educated at the University of Wales, Aberystwyth, and Edinburgh University, where he graduated M.B. in 1890, proceeding to the M.D. in 1900. After a period as house surgeon to the Caernarvonshire and Anglesey Infirmary, where he was later to give many years of devoted and enthusiastic service, he settled in Bangor, and soon established a large practice in the town and surrounding district. From his earliest days he had shown aptitude for surgery, and his appointment in 1910 as surgeon to the Caernarvonshire and Anglesey Infirmary marked the beginning of a new era in the surgical work of this hospital. At the end of his 20 years' tenure of office, the hospital committee, as a mark of their appreciation of his work, took the unusual step of inviting him to continue as senior surgeon. During the whole of the war Dr. Thomas was surgeon to the Military Hospital at Bangor. His reputation as a surgeon was such that for many years his colleagues throughout North-West Wales availed themselves fully of his experience and operative skill. His surgical appointments included those of consulting surgeon to the Blaenau Festiniog and Portmadoc war memorial hospitals. He was a member of the court of governors of the University College of North Wales, and was medical officer to this College and to the Bangor Normal College. Though his large general and consulting practice kept him very busy he found time for public work as well. He was an alderman of the corporation of Bangor and was mayor of the city in 1920–21. He was a justice of the peace for the county of Caernarvon and sat regularly on the bench. He is survived by his widow, three daughters, and one son, Mr. T. Meyrick Thomas, F.R.C.S.

EDWARD WILLIAM WOOD WHITE, M.D. Dub.

Mr. Wood White, who died on March 22nd at Birmingham at the age of 76, was of Irish descent and was born in Ireland. He was a graduate of Trinity College, Dublin, proceeding to the degrees of B.A. in 1875, M.B. in 1877, and M.D. in 1893. Subsequently he studied at the London Hospital and was for three months house surgeon to Mr. Jonathan Hutchinson. His experience there it was that probably decided him to pursue ophthalmology. In 1879 he was appointed house surgeon to the Birmingham Eye Hospital, a position he held for five years, and at the end of which time he was elected honorary surgeon to the hospital, an office he discharged punctiliously and with great success until his retirement in 1910, when he became a consulting surgeon. He secured the confidence of his professional brethren and of the public alike, and had a successful career in his specialty. He took his share in the work of the local medical societies, was honorary secretary for some years of the Medical Institute, and served as president of the Midland Medical Society. On five occasions he delivered the Middlemore Lectures in Ophthalmology, his subjects being eye symptoms in diseases of the general nervous system, corneal ulcers and their treatment, inflammation of the conjunctiva, glaucoma, and injuries to the eye-ball and its neighbourhood; but apart from these he made few contributions to medical literature. Some years ago increasing deafness led to his retirement from practice, and for the last few years of his life he suffered from cardiac disability due to high blood pressure. "He met his distresses," writes a colleague "with high courage and patience, and after months of anxious illness he regained some activity and actually resumed golf, for which he had great enthusiasm. For many years he was a keen lawn-tennis player, and acquired considerable skill in the game. Those of his contemporaries who remain remember Wood White with great affection, not only as a skilful ophthalmologist, but as a courteous gentleman and a loyal friend."

THOMAS REDMAYNE, M.B. Camb., F.R.C.S. Eng.

WE have to record the death of Mr. Thomas Redmayne on April 1st at St. Leonards-on-Sea at the age of 67. A son of the late Mr. R. R. Redmayne, of Newcastle-upon-Tyne, he was educated at Repton School and Trinity College, Cambridge, where he was an exhibitioner. After taking a second class in the Natural Sciences Tripos he went to the London Hospital whence he qualified as M.R.C.S. in 1886. After serving as house surgeon, house physician, and receiving-room officer, and going abroad as a ship's surgeon, he became F.R.C.S. in 1889 and settled in practice at Gateshead. Later moving to St. Leonards-on-Sea he became assistant surgeon to the Royal East Sussex Hospital, Hastings, which institution he served for 34 years, succeeding Dr. Cecil Christopherson as senior surgeon. He was also chairman of the medical committee of the hospital and had a large surgical practice in the locality. In leisure time he was interested in golf, fishing, climbing, and music.

Mr. Redmayne was at one time president of the East Sussex Medico-Chirurgical Society. He leaves a widow with two daughters. A son died at an early age.

PUBLIC HEALTH SERVICES

MENTAL TREATMENT ACT, 1930.

THE PROVISION OF TEMPORARY TREATMENT.

BY JOHN P. STEEL, M.D. EDIN.,
DEPUTY MEDICAL SUPERINTENDENT, ST. LUKE'S HOSPITAL, MIDDLESBROUGH.

WHILST the Act has not been in force for a sufficient length of time to allow the full benefit therefrom, it is evident that it will go a long way towards the attainment of its end, which is the prevention of certification of recoverable cases. The extension of the voluntary boarder system will, when the terms of the Act become more readily carried out, help to prevent the borderline case; provision of temporary treatment without certification should ensure that none but the chronic case reaches the mental hospital proper. At present the Act is likely to be accepted in part rather than as a whole, because the accommodation for patients suffering from mental instability is somewhat limited outside the mental hospital, and until this is remedied the full benefit of the new regulations are not available. To the ordinary person it does not matter whether a patient is admitted to the mental hospital as a voluntary boarder or under recommendation for temporary treatment; once they have been in a mental hospital they are labelled as having been "insane."

The ideal combination of circumstances is to have clinics at the ordinary hospitals (many of course being already in operation) with observation wards attached, and where this is possible the patient can be observed for a reasonable time so that a considered decision and diagnosis can be given, and full advantage can be taken of specialist examination in the hospital. If, after careful consideration and treatment, the case is deemed unsuitable for the observation ward, then the next step should be a half-way one to the mental hospital—viz., to an institution entirely and completely detached from the mental hospital, and with no administrative connexion therewith. In this place there should be no reason for the withholding of the more specialised treatments presently found in the mental hospitals proper, and in this half-way house it would seem probable that the voluntary boarders and the recovering patients under temporary treatment without certification would recover (where recovery is probable) without recourse to the mental hospital at all.

Naturally this is the ideal—but few municipalities or counties are yet equipped for such methods. As an alternative, and until the provisions of the Act make buildings of the type possible, there is the municipal hospital with the "observation" ward. Patients recommended for temporary treatment can be accommodated in this way, and there is not the same stigma attached to residence in such a hospital as there is to a similar stay in a mental hospital; for although the Act does away with the term "asylum," it will remain in force in conversation for a long time to come, and will convey the impression of "lunacy" just as it always has done. The main difficulty lies in the shortage of suitable accommodation at the general hospital, and the dislike on the part of the patient to be considered a "mental" case. The provision of suitable accommodation in the municipal hospital, or the provision of separate hospitals altogether, will quickly overcome this dislike; at the clinics already in operation it is not found that patients object to general hospital methods, and these clinics are able to obtain a percentage of true borderline cases. Until some suitabl hospital or series of wards are provided as a separat entity, the part of the Act dealing with volunta boarders and temporary treatment without certification will not be as beneficial as it might.

Steps are being taken by some municipal authoritie to appoint medical officers in charge of the mental services, a step in the right direction provided tha those appointed have reasonable power to enforce their recommendations for preliminary treatment. If this is not provided then it will be quite possible for a medical officer to see a case at a municipal (or general) hospital and to make suggestions for treatment which will in his opinion clear up the cas without recourse to certification. If he has not th authority to see that these methods are carried ou he may be chagrined to receive intimation by the next post that the case has been certified, and a request for allocation to a mental hospital. Under such circumstances his appointment is a waste o money and a stultification of the meaning of the Act.

The whole purpose of the Act is to endeavour to keep cases out of the mental hospitals; at presen there are few suitable places where recoverable case can be treated except in the mental hospitals, and i will mean the expenditure of very large sums t provide such places.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDE MARCH 28TH, 1931.

Notifications.—The following cases of infectiou disease were notified during the week: Small-pox, 220 scarlet fever, 1500; diphtheria, 979; enteric feve 24; pneumonia, 2012; puerperal fever, 51; puerper pyrexia, 148; cerebro-spinal fever, 66 (last week 84) acute poliomyelitis, 6; acute polio-encephalitis, 2 encephalitis lethargica, 12; dysentery, 6; ophthalm neonatorum, 108. No case of cholera, plague, c typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of th London County Council on March 31st–April 1st was a follows: Small-pox, 224 under treatment, 2 under observation (last week 231 and 10 respectively); scarlet fever, 1277 diphtheria, 1676; enteric fever, 125; measles, 133 whooping-cough, 441; puerperal fever, 29 (plus 14 babies encephalitis lethargica, 122; poliomyelitis, 2; "oth diseases" 187. At St. Margaret's Hospital there we 14 babies (plus 5 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, includi London, there was no death from small-pox, 1 (from enteric fever, 60 (1) from measles, 9 (1) fro scarlet fever, 46 (11) from whooping-cough, 30 (from diphtheria, 72 (16) from diarrhœa and enterit under two years, and 301 (42) from influenza. Th figures in parentheses are those for London itself.

Five deaths from meningococcal meningitis occurred London, 1 from 1–2 years, 2 from 2–5 years, and 1 ea from 15–25 and 35–45 years. Fifteen fatal cases of meas were reported from Liverpool, 10 from Birmingham, 4 fro Newcastle-on-Tyne. Salford reported 4 deaths fro whooping-cough, Manchester 3. Diphtheria claimed victims at Leeds. The 259 fatal cases of influenza outs London are scattered over 82 great towns: 20 were report from Sheffield, 11 each from Stoke-on-Trent, Manchest and Leeds, 10 each from Bristol and Birmingham.

The number of stillbirths notified during the we was 305 (corresponding to a rate of 45 per 1000 births including 45 in London.

(*Continued at foot of opposite page.*)

CORRESPONDENCE

TREATMENT OF RHEUMATOID ARTHRITIS.

To the Editor of THE LANCET.

SIR,—There is much in Dr. Douthwaite's paper in your last issue (p. 785) that is valuable to all interested in rheumatoid arthritis, but his opinion concerning the value of vaccines is open to discussion. By vaccines I presume he means not only the simple suspensions but also residual vaccines in which I am chiefly interested, and I suppose his criticism must apply to this type equally. I have published records of treatment with autogenous residual vaccines in selected cases and the results were assessed by other observers. Further, the series was consecutive and contained all the failures. The proportion of cases which benefited was high and the only selection made was bacteriological. I refused vaccine treatment to all cases in which I did not find satisfactory evidence of streptococcal infection in the throat, teeth, tonsils, bowel, or other focus.

Dr. Douthwaite's criticism of vaccines is destroyed by his subsequent statement that protein shock is useful. If vaccines have no specific action then they must act as foreign proteins if at all. It follows from that inference that whilst vaccines may be useful if they are regarded as being made from a specific organism they cannot conceivably be useless when non-specific bacterial proteins are claimed as valuable. In discussions on the relative merits of vaccines and protein shock the supporters of the latter rarely show any appreciation of the two-edged nature of the weapon that they use as an argument. I should like to make clear that my remarks are confined to those cases in which a vaccine is bacteriologically feasible. In my experience they form about half of all cases.

I agree with Dr. Douthwaite that osteo-arthritis is in every way distinct from rheumatoid arthritis. I believe that a large proportion of the latter disease is due to a streptococcus, but from a number of stray items of observation I suspect a staphylococcus as the possible cause of osteo-arthritis. Most observers will agree that the causal organism is not found in the affected area but that the lesions are due to bacterial products carried from some remote focus. In my hands residual vaccines have been more successful than any other form of treatment in the first stage of the disease whilst the patient's potential resistance is still good.

In his excellent clinical description Dr. Douthwaite omits to mention a sign that I have found common in young women when the streptococcal infection, if ascertainable, lies in the throat; the pharynx and pillars of the fauces are bright red and apparently dry, standing out in sharp contrast to the pale buccal mucosa. The tonsils are frequently not enlarged and the toxic products seem to be absorbed from the inflamed area at large.

I am, Sir, yours faithfully,

Manchester, April 6th, 1931. C. E. JENKINS.

(*Continued from previous page.*)

PROVISIONAL DEATH-RATES FOR 1930.

The Registrar-General announces provisional death-rates from certain specified diseases per million population for England and Wales during the year 1930 as follows:—

	Males.	Females.	Persons.
Respiratory tuberculosis ..	863	624	739
Other tuberculosis	174	145	159
Cancer	1411	1404	1454

The maternal mortality per 1000 live births based on deaths primarily classed to puerperal conditions was as follows:—

Puerperal sepsis	1·92
Other accidents and diseases of pregnancy and parturition	2·48
	4·40

OVERCROWDING AS A FACTOR IN OUTBREAKS OF CEREBRO-SPINAL FEVER.

To the Editor of THE LANCET.

SIR,—Prof. Sheldon Dudley, in his first Milroy lecture published in THE LANCET of March 7th, refers to the seeming paradox of the incidence of cerebro-spinal fever in naval boys' training establishments being 30 times greater than in sea-going squadrons; and, as an explanation of this, he mentions the hypothesis that naval recruits obtain a certain immunity against the disease by contact with carriers in the training depôts. Another explanation might be found in the earlier part of the same lecture, where Prof. Dudley states that the ventilation of the modern fighting ship could scarcely be bettered; and describes how, in the sleeping quarters of one ship, despite "the densest overcrowding" there was an almost complete absence of accumulation of atmospheric moisture as a result of the perfected system of ventilation adopted.

It is, I think, in the light of such facts that the 64 cases of cerebro-spinal fever which, according to Prof. Dudley, occurred in the fleet at sea during the whole period of the war must be regarded. This amazingly satisfactory record might indeed be taken as an argument against the importance of overcrowding as a factor in the production of outbreaks of cerebro-spinal fever, if the overcrowding implied is in the sense of deficient *cubic space*, as defined as a principle of investigation by Glover, to whose work in this connexion Prof. Dudley more than once alludes. Overcrowding, as I have been led to regard it in my own specialised work on the disease during the years 1915–1919, is wholly bound up with the question of atmospheric humidity, especially *indoor humidity* in sleeping quarters; and the conclusions embodied in my reports to the War Office and in various published papers[1 2 3] are, I venture to think, further substantiated by the evidence which Prof. Dudley has now brought to bear on the subject. The war period record of the fleet in connexion with cerebro-spinal meningitis can, at all events, be regarded as something more than coincidental testimony to the efficiency of proper ventilation amid conditions in which, to use Prof. Dudley's own words, the density of population reached the "maximum possible," and any "spacing out of beds" as advocated by Glover was an obvious impossibility.

I may recall briefly the main features of the cosmic hypothesis advanced by me in 1915,[1 4 5] and more fully developed during the years 1916–1917. Atmospheric humidity—more especially *indoor humidity* operating through overcrowding and insufficient ventilation[3 9]—constitutes a cosmic factor which favours outbreaks of the disease, the meningococcus being about. This hypothesis, based on ample experimental evidence, affords a reasonable interpretation of the advent of "cases"—viz., that humidity acts by causing congestion and œdema of the naso-pharyngeal mucous membrane, thereby permitting the meningococcus of the "carrier" to penetrate this barrier.[8] Also, it explains how (even in the absence of "spacing out") better ventilation combats overcrowding, by its beneficent action on indoor humidity. The temperature indoors being always higher than that out-of-doors, it follows that when the colder outdoor air (even though saturated) penetrates indoors, through efficient ventilation, it loses much of its saturation. It becomes then less inductive of naso-pharyngeal œdema, thereby diminishing the risk of the meningococcus of the "carrier" migrating to the meninges to produce a "case." [6][9] It will be noted, on this hypothesis, that if the meningococcus is not about, the degree of humidity becomes of no importance, since cases of cerebro-spinal fever cannot then occur. This gives, I think, some point to the opinion of Prof. Dudley that "the importance of air supply per se in the prevention of disease has perhaps been overstressed," if by this he presupposes that pathogenic bacteria are not about. Prof. Dudley's contention here seems to me to express but a particular aspect of the more general truth embodied in the cosmic hypothesis put forward by me.

An interesting question arises. What is it that rids the carrier of his meningococcus at sea? I had formerly assumed in my own work ashore that three meteorological factors dominated the situation: absence of atmospheric saturation, unequable condition of temperature, and presence of sunshine (all three of which are interconnected [2, 8]); and that seemed to constitute a good enough working hypothesis then, for I had often noticed that carrier-rates in carrier isolation camps quickly improved with the arrival of sunshine and resulting outdoor life. It is possible that the beneficial action of these same factors are accentuated at sea.

In brief, then, it does appear to me that Prof. Dudley's evidence abundantly confirms the established ideas which I have formed as the result of my own observations and experimental work. Assuming the best atmospheric conditions in the fleet below decks, it would seem that we can dispense with the sunshine, and trace the navy's comparative freedom from cerebro-spinal fever to the absence of that atmospheric moisture which enabled me during the war period to predict, with more or less assurance, the imminence of "cases." I am, Sir, yours faithfully,

Alexandria, Egypt, March 24th, 1931. A. COMPTON.

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(1) (2) (3) War Office Reports on Cerebro-spinal Meningitis in Dorset District, August 2nd, 1915, Oct. 16th, 1916, and Nov. 1st, 1917.

(4) Report on Cerebro-spinal Meningitis occurring in the Dorset Military Area during the period March to July, 1915, Jour. R.A.M.C., 1915, p. 546; THE LANCET, 1916, i., 255.

(5) Influence de quelques facteurs météorologiques sur l'apparition des cas de méningite cérébro-spinale, C. R. Acad. Sc., 1915, clxi., 472.

(6) Susceptibility to Cerebro-spinal Fever in Relation to Age, THE LANCET, 1917, ii., 14.

(7) Méningite cérébro-spinale et météorologie, C. R. Acad. Sc., 1917, clxv., 73.

(8) Études sur la méningite cérébro-spinale et ses facteurs météorologiques, Ann. Inst. Past., 1918, xxxii., 117.

(9) Outbreaks of Cerebro-spinal Fever in Relation to Atmospheric Humidity, THE LANCET, 1919, ii., 154.

POLYVALENT NATURAL ANTIBODY.

To the Editor of THE LANCET.

SIR,—For many years I have been working on the possibility of making use of the bactericidal powers of normal blood-serum. The steps have been described in medical and veterinary journals commencing in THE LANCET (1924, i., 431), and in conjunction with my clinical co-workers, summarised in the *Medical World* (April 11th to May 2nd, 1930). The demand for the various therapeutic combinations became so great that the possibility of manufacture on a large scale had to be considered. It is obviously of vital importance that the antibody combinations must be accurately made and standardised. I know from long experience how slight an error will yield a comparatively inert compound as regards antibacterial action, both in vitro and clinically. Unless the antibody combinations reach the highest standard of accuracy they will tend to discredit a scientific principle that I am sure is sound. For about a year, under the names Edwenil, Davenil, and Globenil, and accompanied by some of my medical bibliography, E. H. Spicer & Co., Ltd. have been offering to the profession these biochemical preparations based on my work. After this date I wish it to be definitely known that I have no further association whatsoever with E. H. Spicer & Co., Ltd., or the manufacture of their products.

I am, Sir, yours faithfully,

Leamington Spa, April 6th, 1931. S. G. BILLINGTON.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

EASTER ADJOURNMENT.

THE House of Commons adjourned on Thursday, April 2nd, for the Easter recess until Tuesday, April 14th.

BETHLEM ROYAL HOSPITAL.

On March 31st the House of Commons considered the Civil Estimates in Committee.

On a vote for £318,200 for expenditure on art and science buildings in Great Britain, Mr. C. WILLIAMS called attention to an item headed "Bethlem Royal Hospital, adaptation for Imperial War Museum." He said that that represented £50,000, which was a very large sum, and the committee were entitled to know precisely what was being done to the hospital.

Mr. LANSBURY (First Commissioner of Works), in reply, said that the public of London were grateful to Lord Rothermere for making it possible for the Government to take over that fine estate. Originally it was proposed to pull down the whole building, but it had now been decided that the War Museum in the Western Galleries adjoining the Imperial Institut should be transferred. The L.C.C. would have t bring in a Bill to obtain powers from Parliament t alter the original Act for dealing with the Bethle Hospital. Lord Rothermere and the L.C.C. ha agreed, and the Government were now asking th House to agree to a proposal to use one portion o Bethlem Hospital to house the War Museum. A 999 years' lease was being negotiated at £1 a yea to carry out this object. Replying to Mr. Kell Mr. Lansbury said no money had yet been spent o adapting the buildings. £5000 had been voted, bu the Government would not spend one penny unt it was quite certain that the Museum would b moved there. It was practically certain that i would be so. The vote was agreed to.

VENTILATION OF HOUSES OF PARLIAMENT

On a vote for £78,430 for expenditure on the House of Parliament, Miss WILKINSON asked if anything was being spent on improving the antiquated system of ventilation. The sickness-rate and even the death-rate among Members of Parliament had been very high in the past few months. The sickness-rate had been specially high, and all of them felt that when they came into the House they were entering a building where no fresh air seemed to enter at all. She understood that the system, which was experimental when first put in, was now admitted by every kind of expert to be antiquated. The air came up through the gratings on the floor and passed their dusty boots before it got to their nostrils; there was no fresh air coming in anywhere. It was disgusting to think that the air they had to breathe came welling up through the gratings in the floor. She was told that the air was supposed to be purified and washed before it got to Members, but even if that were wholly scientific and wholly true the air would be contaminated by the dust of the streets which was presumably on their boots. The difficulty was that the cleaning of the air was not effectively done. In the early afternoon fumes were often drawn into the chamber. The air was drawn from the surface of the Thames, washed and pumped through to Members. It was possible to tell when a tug was passing and dipped its funnels to go under the bridge, for Members got the heavy smoke from it, and obviously other impurities as well. The ventilation system was put in before there were so many petrol fumes on the Thames. Now the fumes rested on the water and were drawn into the House, and presumably contained carbon monoxide as well. The atmosphere was getting steadily worse, and something should be done. The system of ventilation needed modernising. The inventions of modern science ought to be used to bring up to date the House where they had to spend a large part of their working life.

Mr. STRAUSS supported Miss Wilkinson's complaint, and said that the atmosphere of the House and the precincts was enervating. It was so heavy, so devitalising, that most people suffered from headaches and found it almost impossible to concentrate on their work.

Mr. LANSBURY said that he did not understand the criticisms in regard to the atmosphere of the House. He had read most of the reports. They all disagreed with one another, and the experts that he had consulted all contradicted one another. A committee was appointed recently on the subject, and they reported that such defects as existed in the ventilation were attributable to the methods of distributing the air current and not to the quality of the air admitted, which was both chemically and bacteriologically pure. Miss Wilkinson had said that he breathed poison all the time that he sat on the Government bench, because the air was coming through the floor over his dirty boots. Experts who had examined the air told him that it was pure.

Dr. HASTINGS asked if the examination was made when the House was sitting?

Mr. LANSBURY said that all he knew was that the committee reported in 1905. In 1923 another committee made certain recommendations, the important part of which had been carried out. Further works suggested could be carried out for £5000, but the difficulty was that people were not agreed that when that sum had been spent they would have done what Members thought was right. He did not want to spend money unnecessarily, but if it could be proved that the health of Members really was in danger by lack of proper ventilation, the department, if it was instructed to do so, would be only too glad to take more advice—they had taken a lot already—to see if they could get the experts to agree.

The vote was agreed to.

HOUSE OF COMMONS.

TUESDAY, MARCH 31ST.

Hospital Sweepstakes.

Mr. TOOLE asked the Prime Minister whether, in view of the extent to which people in this country took part in the Irish Free State sweepstakes, as revealed by the results of the draw, the Government could see their way to introduce legislation to enable similar sweepstakes to be conducted in this country to aid hospitals in need of funds.—Mr. CLYNES replied: Apart from any other consideration, I have yet to learn that the hospital authorities desire such legislation.

Washington Hours Convention.

Sir THOMAS INSKIP asked the Minister of Labour whether she had ascertained that the conditions upon which France and Italy respectively ratified the Washington Hours Convention would be satisfied, so far as Great Britain was concerned, by ratification by His Majesty's Government subject to the provisions of the Hours of Industrial Employment Bill.—Miss BONDFIELD replied: The condition attached by France is ratification by Germany and Great Britain. The condition attached by Italy is ratification by Belgium, France, Germany, Great Britain, and Switzerland. I am unaware of any other conditions.

Sir THOMAS INSKIP asked the Minister of Labour whether Germany had taken any steps to ratify the Washington Hours Convention.—Miss BONDFIELD replied: I understand that legislation intended to enable the German Government to ratify the Convention is under consideration.

WEDNESDAY, APRIL 1ST.

Report of Hedley Committee.

Lieut.-Colonel FREMANTLE asked the Minister of Health whether the Hedley Committee, appointed by the Board of Control, had completed their report; and, if so, when it would be published.—Mr. GREENWOOD replied: I understand that this report will be presented to the Board shortly after Easter, and the question of publication will then be taken into immediate consideration.

Rubber Paving Round Hospitals.

Mr. GRAHAM WHITE asked the Minister of Transport if, in view of the opportunity afforded by the low price of rubber, he would, where possible, direct and elsewhere recommend that the roadways immediately around urban hospitals be covered with a rubber surface.—Mr. H. MORRISON replied: I understand there has been a considerable reduction in the price of rubber paving blocks, but that the cost is still relatively high. Local authorities are in the best position to judge of the circumstances which should govern the choice of paving materials, and I do not think it would be appropriate for me to exert pressure on them in the direction which the hon. Member suggests.

Birth Control Literature.

Sir JAMES REYNOLDS asked the Postmaster-General if his attention had been drawn to the extensive use of the post for the dissemination of birth-control literature; and if he would take further steps to prohibit such use of the post.—Mr. VIANT (Assistant Postmaster-General) replied: My attention has been drawn to the fact that such literature is sent by post, but I am advised that, unless the language used is indecent or obscene, I have no power to prohibit the transmission of such matter by post.

THURSDAY, APRIL 2ND.

Infant Mortality.

Mr. DAGGAR asked the Secretary of State for Scotland the number of children under the age of 12 months who died in Scotland during 1930.—Mr. ADAMSON replied: The number of children under the age of 12 months who died in Scotland in 1930 was 7851, which represents an infantile mortality-rate of 83 per 1000.

Blind Persons.

Dr. FORGAN asked the Minister of Health the latest estimate of the number of totally blind persons in England and Wales.—Mr. GREENWOOD replied: I have no information as to the number of totally blind persons in England and Wales, but the number registered as blind within the meaning of the Blind Persons Act, 1920, was 52,727 on March 31st, 1929, the latest date for which figures are at present available.

Workmen's Compensation Medical Appeals.

Mr. LAWTHER asked the Home Secretary the number of cases referred to the medical referees under the Workmen's Compensation Act in the mining industry in Durham for 1928, 1929, and 1930; and the percentage for and against the workmen.—Mr. CLYNES replied: The total number of cases so referred was in 1928, 590; in 1929, 544; and in 1930, 746. I am unable to give the information asked for in the latter part of the question, except as regards cases of industrial disease, where there was an appeal from the decision of the certifying surgeon under Section 43 (1) (f) of the Act. These cases numbered 58, 44, and 62 in 1928, 1929, and 1930 respectively. The percentage of these cases decided in favour of the workman during the three years' period was 68.

Mr. McKINLAY asked the Home Secretary if he was aware of the grave dissatisfaction in Scotland caused by the attitude of the medical referees under the Workmen's Compensation Act; and whether he would appoint a small committee to survey the decisions of such referees with a view to rectifying a long-standing complaint.—Mr. CLYNES replied: I have received complaints as to several of the medical referees appointed for Lanarkshire, but the allegations have been of a general character, to the effect that the referees are biased against the workmen, and that their decisions are unfair, and they have not been supported by evidence. Particulars of only three cases in which it was alleged that the workman had been unjustly treated have been submitted; and while I am not in a position to review the decisions of referees, I have carefully examined these particulars, and cannot find anything in them to sustain such a charge. Great pains are taken to appoint as referees doctors of the highest possible standing and professional qualifications; and once a person is appointed to a judicial post of this kind he is entitled to expect that the Home Secretary will not countenance charges of unfairness except on clear and definite evidence of incompetence or bias. A general survey of the kind mentioned in the question, even if practicable, would not in the circumstances be justified.

MEDICAL NEWS

University of Aberdeen.

On April 1st the honorary degree of Doctor of Laws was conferred among others in Sir Leonard Hill, M.B., F.R.S. and Dr. C. R. Marshall, emeritus professor of materia medica in the University. Ordinary degrees and diplomas were conferred on the following:—

M.D.—N. M. Munro (awarded commendation for thesis) A. G. Morison, W. E. Morrison, and J. B. Samson.

M.B., Ch.B.—H. W. Fullerton (with First-class Honours), J. A. Birnie, S. A. B. Black, D. S. Cochran, W. L. Donaldson, G. MacN. R. Duffus, I. R. G. Galloway, W. H. Gossip, R. D. Henderson, J. W. Levack, Hugh Livingston, E. O. Low, D. S. Macdonald, J. B. Macfarlane, J. S. B. Mackay, T. A. Morrison, R. G. Russell, W. R. Scott; J. M. Stuart, A. G. D. Whyte, and R. D. B. Wright.

D.P.H.—E. A. Johnston, S. S. Proctor, and J. C. Sleigh.

Congress of Tropical Medicine.

The second International Congress of Tropical Medicine will be held at Amsterdam from Sept. 12th to 17th under the presidency of Prof. G. Grijns. The subjects of discussion will be (1) avitaminoses, with special reference to beriberi, (2) leptospira and yellow fever, (3) helminths, with special reference to ankylostoma, and (4) malaria, blackwater fever, protozoal blood diseases, and kala-azar. The general secretary is Prof. E. P. Snijders of the Institute of Tropical Hygiene, Amsterdam.

Maternity and Child Welfare Conference.

A national conference on maternity and child welfare, organised by the National Association for the Prevention of Infant Mortality, will be held at the City Hall, Cardiff, from July 1st to 3rd. The main subjects of discussion will be a maternity service for the whole nation, the physical and mental health of the normal child of 1–5 years, and children in institutions or boarded-out. Full particulars may be had from the hon. secretary of the association, 117, Piccadilly, London, W.1.

Tavistock-square Clinic.

In connexion with this clinic for functional nervous disorders (51, Tavistock-square, London, W.C. 1) 24 lectures on Psychological Types and Mechanisms will be given on Thursdays from April 30th at the Royal Anthropological Institute, 52, Upper Bedford-place, W.C. Two lectures will be given on each day, the first at 3 P.M. by Dr. Hugh Crichton-Miller, honorary director of the clinic, and the second at 4.30 P.M. by Dr. E. Graham Howe. The course is open only to members of the medical profession. The programme and tickets may be had from the hon. lecture secretary at the clinic.

Royal Institute of Public Health.

The annual congress of this institute will be held at Frankfurt a. M., Germany, from Tuesday, May 19th, to Sunday the 24th (Whitsuntide), under the presidency of Lord Reading. The six sections will be concerned with State medicine and municipal hygiene; architecture, housing and town-planning; industrial hygiene; women and children and the public health; tuberculosis; and pathology, bacteriology and biochemistry. Visits may be paid to centres of interest in and around the city, and to neighbouring spas. The preliminary programme may be had from the hon. secretary at 37, Russell-square, London, W.C.1. Membership of the congress is open to anyone interested.

Legacies to Manchester Hospitals.

At the annual meeting of Ancoats Hospital, Mr. P. M. Oliver, M.P., the treasurer, stated that last year that institution received £20,000 in legacies, and that during the last two years the Manchester hospitals together had received in bequests £335,000. Broadly speaking, 4*s.* 6*d.* in every pound of their incomes came from investments. Mr. Oliver argued that the adoption of sweepstakes would have an unhappy effect upon legacies.

Post-graduate Work at Newcastle.

Post-graduate lectures and demonstrations in medicine surgery, and gynæcology will be given at the Royal Victoria Infirmary, Newcastle-upon-Tyne, from 1.30 to 5.30 P.M. on Thursdays, from April 16th to June 18th. Application should be made not later than April 13th to the Registrar of the College of Medicine at Newcastle.

Cameron Hospital, West Hartlepool.

A children's block, costing between £5000 and £6000, has been added to this hospital. The additions include a ward and veranda with accommodation for 28 beds, and a new all-weather veranda to another ward increasing its accommodation by six beds. Hitherto children have had to be placed in adult wards.

East London Hospital for Children.

The annual report of this hospital at Shadwell, E., states that last year the income fell short of the expenditure by nearly £3000. The ordinary income increased by over £1600, but legacies fell by £670, and although the ordinary expenditure was reduced by £700, a sum of £7850 is owing to the bank. The increase of in-patients treated in the wards exceeded 100, but a dearth of nurses has, it is stated caused a drop in the average number of occupied beds.

Royal Portsmouth Hospital.

The annual report records a steadily increasing demand upon the resources of the hospital, and the surgical staff greatly feel the need of more bed accommodation. Last year there were 3731 in-patients (495 accidents) and 20,700 out-patients, 9456 of whom were casualties. The in-patients stayed an average of 18 days; their average cost was £5 18*s.* 8*d.*, at the rate of £2 6*s.* 1*d.* per week, a slight increase.

Queen's Hospital, Birmingham.

It is announced that unless £3800 is found by this hospital before the end of June, a ward of 24 beds will be closed, the working expenses in 1930 having exceeded the income by £12,000.

Sheffield Royal Infirmary.

Last year the income of this hospital (£60,043) was £11,100 less than the expenditure, and capital expenditure has consequently had to be postponed. It has been suggested that the income of the hospital contributors' association might be increased substantially by obtaining a penny a week from the unemployed of the city and by bringing the "black-coated" workers into the contributory scheme.

Deaconess Hospital, Edinburgh.

Lord Sands, in presenting the thirty-sixth annual report of the Church of Scotland Deaconess Hospital, Edinburgh said that the number treated during the year was 941, an increase of 240 on last year. The major surgical operations were 626, against 373 last year. In the out-patient department there were 7573, as against 6703. This hospital is maintained by the Church of Scotland, as a recognition of the Church's social obligations. Every county in Scotland sends patients. The number of beds is 52.

Motor Insurances and Hospital Costs.

Of the 15,000 casualty and emergency cases treated at Leeds General Infirmary last year, 1205 were accidents attributable to motor vehicles, a slight increase from 192 They cost £4690, an increase of £425. The hope that the Road Traffic Act would give substantial relief in this direction is not being fulfilled, the insurance companies it was stated at the annual meeting, paying to the hospitals only when their insured are shown to be in the wrong.—Victims of road accidents are costing the East Suffolk and Ipswich Hospital about £3000 a year.

Medical Fees at Malton Hospital.

The rules of this institution have been altered to enable payments to be made, in certain cases, to the medical staff. Hitherto any person subscribing 5*s.* per annum was entitled to free hospital treatment, not only for himself, but also for his wife and his children up to 18 years of age. Treatment will still be free to subscribers without dependants whose income is less than £3 a week, and to those with dependants whose incomes are below £4 a week, and other patients may be excused from payment at the discretion of the monthly board. The maximum fee for major operations will be £10 10*s.*, and for minor ones £5 5*s.* Medical cases will pay a maximum of £2 2*s.* a week.

Royal Victoria Infirmary, Newcastle-on-Tyne.

The volume of work last year was greater than at any previous period, the in-patients numbering 15,164. The total number of beds available, including those at the Innes Hopkins Memorial Home, was 576, but the daily average number in occupation was 601. Of the 22,468 accidents treated—an increase of 412—1590 were due to motor traffic; 454 were admitted to the wards, involving a daily occupation of 19 beds. The governors contemplate the provision of further bed accommodation in the main part of the hospital, a complete orthopædic block, a new casualty and reception department, and a new block for the resident medical staff. The cost per occupied bed has been reduced from £160 to £154; the income was £100,257 and the expenditure £93,537. The three wards set aside for paying patients will contain 86 beds.

Financial Position of Liverpool Hospitals.

At the annual meeting of the Merseyside Hospitals Council last week the chairman, Lord Cozens-Hardy, made the disquieting statement that "the financial position of the Merseyside hospitals is still dependent on a continuance of the stream of legacies." Last year the penny-in-the-pound fund contributed £101,000 to the 22 associated voluntary hospitals, but, he explained, that represented only 30 per cent. of their total ordinary income which was £30,000 less than the general fund expenditure, but legacies had reduced the deficit by £25,000. But the £101,000 from the contributory fund covers barely three-quarters of the cost to the hospitals of the contributors and their dependants.—The financial liabilities of the Liverpool Royal Infirmary now amount to nearly £36,000.—The loss on last year's working of the Royal Southern Hospital, Liverpool, was £9515, and at the beginning of the year the hospital owed the bank £10,919, which was reduced by £13,481 by the sale of investments. Proposed extensions have had to be postponed.

Prince Alfred Hospital, Sydney.

In the year ending June 30th, 1930, there were 9550 admissions; 5707 contributed towards the cost of their maintenance to the extent of £10,715. The average stay (530 beds) was 21·31 days. In the out-patient and casualty departments there were 54,241 patients; in the radium clinic there were 5702 attendances. The deep X ray therapy department cannot cope with the volume of work. The hospital has always been the principal clinical school of the University, and it has been felt that the teaching of medicine and surgery, as distinct from the teaching of physiology, anatomy, &c., should be carried out in closer relation to the wards and departments of the hospital. Having this in view, the University of Sydney has received, through the generosity of Mr. G. H. Bosch, the sum of £220,000 for the specific purpose of carrying out the whole of the work of teaching medicine, surgery, and bacteriology in or close to the hospital, and £100,000 has been set aside for the necessary building.

Orthopædic Hospitals.

Plans are being prepared for the rebuilding of the Shropshire Orthopædic Hospital at Baschurch; the existing buildings are of a temporary character. Last year 1413 patients were treated, by whom, or on whose behalf, £41,052 was paid. A large number are received through the agency of public authorities. An offspring of the hospital is the Derwen Cripples' Training College, in grounds adjacent to the hospital, to which patients are sent to be trained in various trades to earn their own livelihood. The work here has so developed that an expenditure of £20,000 to provide additional accommodation is contemplated.—Wingfield Orthopædic Hospital is also to be rebuilt, Sir William Morris having given £17,000 for the purpose. Four of the new wards and the nurses' quarters are expected to be completed this year. In 1930 the patients treated numbered 153 men, 102 women, and 209 children; in addition 95 patients were treated in the private wards. At £22,739 the income exceeded expenditure by £1708.

Glasgow Samaritan Hospital.

At the annual meeting of the Royal Samaritan Hospital for Women, Glasgow, Sir John Stirling Maxwell, the President, recalled that at a similar meeting he had attended in 1890 it was mentioned with satisfaction that 593 in-patients and 508 out-patients had been treated. In 1930 the figures were respectively 3013 and 5078. There had, he said, been a decrease in income, but it was a very small one considering the difficult times.

Glasgow Lock Hospital.

The directors are considering the suitability of some houses on the coast for establishing a convalescent home for children treated at this hospital. Baillie James Dunlop, presiding at the 125th annual meeting recently, said that the financial position was quite satisfactory. He felt very strongly, however, that there was a great need for obtaining compulsory powers to enforce the completion of treatment in defaulters. There was no doubt that efforts in combating venereal diseases were seriously handicapped by inability to ensure a full course of treatment in all cases who reported.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, April 13th.—4.30 P.M., UNITED SERVICES. Annual General Meeting. Election of Officers and Council Paper: Colonel P. H. Henderson: Ambulance Transport in Undeveloped Countries.

TUESDAY.—5.30 P.M., ORTHOPÆDICS. (Cases at 4.30 P.M.) 8.30 P.M., PSYCHIATRY. Short Papers. Dr. G. de M. Rudolf: The Experimental Treatment of Schizophrenia. Dr. E. B. Strauss: Some Principles Underlying Prognosis in Schizophrenia.

WEDNESDAY.—5 P.M., HISTORY OF MEDICINE. Paper: Dr. J. D. Rolleston: J. B. Bouillaud (1796–1881): A Pioneer in Cardiology and Neurology. MEDICINE AND NEUROLOGY. Members of these Sections are specially invited to attend the meeting and take part in the subsequent discussion.

THURSDAY.—8.30 P.M., NEUROLOGY. (Cases at 7.45 P.M.) Clinical Meeting at the West End Hospital for Nervous Diseases, Welbeck-street, London, W. Cases will be shown.

FRIDAY.—5.30 P.M., CLINICAL. (Cases at 4.30 P.M.) Cases. Mr. Cecil P. G. Wakeley: 1. Case of Acromegaly. 2. Compressed Fracture of the Lumbar Vertebra. Mr. P. Lockhart-Mummery: 3. Megacolon Treated by Appendicostomy. 4. Carcimona of the Rectum, Seven Years after Operation by Perineal Excision. 5. Colectomy for Multiple Adenomatosis (with Family History). Dr. J. D. Rolleston and Dr. D. G. Macpherson: 6. Tracheotomy in an Adult for Œdematous Laryngitis in Scarlet Fever. Mr. Eric A. Crook: 7. Exophthalmos. Dr. Maurice E. Shaw: 8. Popliteal Aneurysm. Other speakers will take part. 8.30 P.M., ELECTRO-THERAPEUTICS. Short Papers. Dr. J. C. Mottram: Secondary Radiation in Bone. Dr. John Halliwell: Pyelography. Dr. C. A. Robinson: Backache in its Relation to Cervicitis, and its Treatment by Diathermy

HARVEIAN SOCIETY.

THURSDAY, April 16th—4.30 P.M. (at King's College Hospital, Denmark Hill, S.E.). Clinical Meeting.

PADDINGTON MEDICAL SOCIETY.

TUESDAY, April 14th.—9 P.M. (at the Paddington Tuberculosis Dispensary, 20, Talbot-road, W.), Dr. R. S. Walker: The Work of the Tuberculosis Dispensary.

ROYAL SOCIETY OF ARTS, John-street, Adelphi, W.C.

WEDNESDAY, April 15th.—8 P.M., Mr. D. R. Wilson: Industrial Lighting.

SOCIETY FOR THE STUDY OF INEBRIETY.

TUESDAY, April 14th.—4 P.M. (in the Rooms of the Medical Society of London, 11, Chandos-street, W.), Dr. C. W. J. Brasher: Absinthe Addiction and the Cocktail Habit.

SOCIETY OF MEDICAL OFFICERS OF HEALTH, 1, Upper Montague-street, Russell-square, W.C.

FRIDAY, April 17th.—5 P.M., Discussion on the Pre-school Child. Openers: Dr. Ethel Cassie and Dr. G. C. M. McGonigle.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.

FRIDAY, April 17th.—4 P.M., Mr. Harold Kisch: Nasal Obstruction.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINIC.

TUESDAY, April 14th.—3.30 P.M. (at the Jessop Hospital), Mr. Chisholm: Heart Disease in Pregnancy and Labour.

FRIDAY.—3.30 P.M. (at the Royal Hospital), Dr. Grout: Radiology in the Investigation of Cardiovascular Disease.

BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck-street, London, W.

THURSDAY, April 16th.—8.30 P.M., Mr. H. S. Souttar: The Ideal Distribution of Radon Seeds. Mr. W. E. Schall: A Two-valve Transformer. Dr. A. Orliansky: Uniformly Impressed Reduced Prints from Contrasty Negatives. Dr. L. A. Rowden: A Technique of Radiographic Pelvimetry.

FRIDAY.—11 A.M., Visit to North Middlesex Hospital, Edmonton. 5 P.M., Medical Members meeting. Discussion on Uroselectan.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.

WEDNESDAY, April 15th.—4 P.M., Mr. Arthur Gray: Common Causes of Sterility and their Treatment.

ANCOATS HOSPITAL, Manchester.

THURSDAY, April 16th.—11 A.M., Mr. H. Platt: Clinical Demonstration. 4.15 P.M., Mr. E. E. Hughes: Renal Infections.

MANCHESTER VICTORIA MEMORIAL JEWISH HOSPITAL, Elizabeth-street, Manchester.

WEDNESDAY, April 15th.—4.30 P.M., Dr. J. W. A. Hunter: Leucorrhœa.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, April 14th.—4.15 P.M., Mr. W. R. Douglas: *Cholelithiasis and Its Complications.*

FRIDAY.—4.15 P.M., Dr. E. B. Leech: Demonstration of Medical Cases.

Appointments

CODY, W. E., L.R.C.P. Lond., M.R.C.S., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Twickenham District of the County of Middlesex.

CURNOW, R. N., M.B., B.S. Lond., Deputy M.O.H. for Derbyshire.

HERBERT S., M.D. Vienna, L.R.C.P. Lond., M.R.C.S., approved by Board of Control under Mental Treatment Act (1930) for Manchester.

Vacancies

For further information refer to the advertisement columns.

Bangor, Carnarvonshire and Anglesey Infirmary.—H.S. £200.
Barnstaple, North Devon Infirmary.—Res. M.O. At rate of £150.
Beckenham, Kent, Bethlem Hospital, Monks Orchard, Eden Park. Two Res. H.P.'s. Each at rate of £25 per quarter.
Bedford County Hospital.—H.S. At rate of £175.
Birkenhead General Hospital.—H.P. £100.
Birmingham, Selly Oak Hospital.—Res. Physician. £550.
Blackburn Royal Infirmary.—Fourth H.S. £150.
Bolingbroke Hospital, Wandsworth Common, S.W.—H.S. At rate of £120.
Brighton, Hove, and Preston Dispensary.—District M.O.
Brighton, Royal Sussex County Hospital.—H.P. £150.
Bristol, Brentry Colony for Mental Defectives, Westbury-on-Trym. Res. Med. Supt. £650.
Bristol General Hospital.—Sen. Res. M.O. £200.
Bristol University.—Lectureship in Physiology. £300–£400.
Burnley, Victoria Hospital.—H.P. At rate of £150.
Burton-on-Trent General Infirmary.—Jun. H.S. £150.
Bury Infirmary, Lancs.—H.S. At rate of £200.
Bury St. Edmund's, West Suffolk General Hospital.—H.S. £180.
Carlisle, Cumberland Infirmary.—H.S. to Eye, Ear, Nose, and Throat Dept. At rate of £155.
Chester Royal Infirmary.—H.S. £150.
Chesterfield and North Derbyshire Royal Hospital.—H.S. At rate of £150.
Doncaster, Royal Infirmary.—H.S. At rate of £175.
Durham County Hospital.—H.S. £150.
Ealing Borough.—Asst. M.O.H. £600.
Gloucester, Gloucestershire Royal Infirmary, &c.—Second H.S. At rate of £120.
Hampstead General and North-West London Hospital, Haverstock-hill, N.W.—H.S. At rate of £100.
Harrogate Royal Bath Hospital, &c.—H.P. At rate of £150.
Hellingly, East Sussex County Mental Hospital.—Jun. Asst. Res. M.O. £350.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—Res. M.O. and H.P. At rate of £150 and £100 respectively.
Hull Royal Infirmary.—H.S. to Ophthal. and Ear, Nose and Throat Depts. At rate of £150.
Kingston-upon-Hull, City and County of.—Asst. Tub. Officer. £600.
Leeds, Herzl Moser Hospital, Leopold-street.—R.M.O. £100.
Lincoln County Hospital.—Jun. H.S. At rate of £150.
Liverpool and District Hospital for Diseases of the Heart.—Two Research Fellows. £200 and £150 respectively.
Manchester Ear Hospital, Grosvenor-square, All Saints.—Non-Res. H.S. At rate of £150.
Manchester, St. Mary's Hospitals.—Four H.S.'s. Each at rate of £50.
Manchester and Salford Hospital for Skin Diseases.—H.S At rate of £100.
Middlesex C.C.—District M.O. £80. Also Public Vaccinator.
Middlesex Hospital, W.—Anæsthetist. Also Asst. Anæsthetist £100.
Newark General Hospital.—Res. H.S. £175.
Newcastle-upon-Tyne, Royal Victoria Infirmary.—Whole-[illegible] Jun. Surg. Reg. £150.
Northampton General Hospital.—Hon. Surgeon.
Nottingham City Infirmary, Bucknall-road.—M.O. £350.
Nottingham General Hospital.—H.S. and H.P. Each at rate of £150.
Oldham Royal Infirmary.—H.S.'s to Special Depts. Each at rate of £175.
Pembury Institution Hospital.—Res. Asst. M.O. £200.
Poplar Hospital for Accidents, East India Dock-road, E.—Sen. Res. O. £200.
Preston, County Mental Hospital, Whittingham.—Med. Supt. £950.
Public Dispensary, 122, Drury-lane, W.C.—Res. M.O. £150.
Queen's Hospital for Children, Hackney-road., E.—2 H.P.'s. Each at rate of £100.
Rainhill, Lancs, County Mental Hospital.—Visiting Radiologist. £150.
Reading, Royal Berkshire Hospital.—Cas. O. and Res. Anæsthetist. Each at rate of £150.
Redhill, Surrey, Royal Earlswood Institution.—Jun. Asst. M.O At rate of £250.
Rochdale Infirmary and Dispensary.—Senr. H.S. At rate of £250.
Rotherham Hospital.—Cas. H.S. £120. Hon. Surgeon to Ear, Nose and Throat Dept. Also Hon. Dental Surgeon to Out-patients' Depts.
Royal College of Surgeons of England.—Examiners in Anatomy &c. Also Examiners under the Conjoint.
St. Mary's Hospital for Women and Children, Plaistow, E.—Asst. Res. M.O. At rate of £120.
Scarborough Hospital and Dispensary.—Two H.S.'s. Each £175.
Sheffield Royal Hospital.—Ophth. H.S. £120. Also H.P. H.S., and Res. Anæsthetist. Each £80.
Simla, India, Nutrition Research Laboratories.—Chief Researc Worker. Rs. 1500 to Rs. 2500.
Singapore, Straits Settlements, Mental Hospital.—Asst. Med Supt. £700.
South London Hospital for Women, South Side, Clapham Commo S.W.—H.P. At rate of £100.
Southport General Infirmary.—Jun. H.S. £120.
Staffordshire General Infirmary.—H.P. £150.
Swansea General and Eye Hospital.—Cas. O.
University College Hospital Medical School, University-stre W.C.—Beit Memorial Fellowship for Medical Researc £400.
Wallasey Victoria Central Hospital.—Jun. H.S. At rate of £100.
Walsall General Hospital.—H.S. At rate of £150.
Western Ophthalmic Hospital, Marylebone-road, N.W.—Sen. Res H.S.'s, and Jun. H.S.'s. At rate of £150 and £100 respectively.
Willesden General Hospital, N.W.—Hon. Clin. Assts. Also H.P At rate of £100.
Wrexham and East Denbighshire War Memorial Hospital.—Res. H.S. At rate of £150.

The Chief Inspector of Factories announces vacancies f Certifying Factory Surgeons at Gnosall (Staffs); Bellshill and Mossend (Lanarks); at Hull (Yorks); an at Thirsk (Yorks).

Births, Marriages, and Deaths

BIRTHS.

BALL.—On March 20th, at "Woodland Croft," Woking, th wife of J. Bramley Ball, L.R.C.P., M.R.C.S., L.D.S. Eng., o a daughter.

HARDIE.—On March 29th, at King-street, Gt. Yarmouth, th wife of Ronald W. W. Hardie, M.B., Ch.B., of a daughter.

MARRIAGES.

JONES—EVANS.—On March 28th, at the Welsh Church, Charin Cross-road, Alan Trevor Jones, M.D., M.R.C.P., of Ca marthen, to Gwyneth Evans, daughter of Mr. and Ms E. Evans, Gunnersbury-avenue, W.

DEATHS.

ANDERSON.—On March 28th, suddenly, at Shanghai, Jo Anderson, M.D., M.R.C.P., D.T.M., of the Henry Lest Institute of Medical Research.

DRAKE.—On March 29th, at Cromwell-road, Canterbur William Drake, M.R.C.S. Eng., L.R.C.P. Lond., former of Taunton and Harwich, aged 59.

REDMAYNE.—On April 1st, at St. Leonards-on-Sea, Thom Redmayne, M.A., M.B., F.R.C.S., aged 67.

STENHOUSE.—On April 4th, at a nursing home, Edinburg Surgeon Rear-Admiral John H. Stenhouse, R.N., retire aged 65 years.

SWAIN.—On March 27th, at Ilford-lane, Ilford, Dr. James Ste Swain (late Major of R.A.M.C., T.F.).

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

THE QUEST CLINIC FOR CHILDREN.

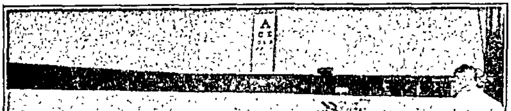
THE "Quest" clinic for children, hitherto situated in Clarendon-road, is continuing its study of nervous and delicate children under very difficult conditions. The clinic is now moving to Robert Browning's house at 19, Warwick-crescent, W.2. It has already achieved interesting results in spite of restricted accommodation, inadequate income, and a great increase in the number of applications for admission. The annual report for the year 1929–30 states that 54 children were treated and that the actual clinical work had to be curtailed in order to organise the office and a system of records. Each child is seen first by a physician, who gives it a complete physical examination and records progress at monthly re-examinations. Children with definite organic disease are referred to the proper authorities; those with mild lesions continue to attend the clinic while receiving treatment elsewhere, whereas those in whom no organic disease is found remain under the sole care of the clinic. There is a small pathological department. It is stated that metabolic urinary studies have been made on most of the cases, but that it has been impossible to develop the laboratory to the extent desired. The work in the psychological department has followed the lines of previous years, involving many kinds of approach by which the child can give expression to its conscious and unconscious phantasies. The methods have proved effective in three cases of epilepsy. The work of the social department has been heavy, and a worker has been lent by the Child Guidance Clinic. Every attempt is made to see the child's adaptation to life from as many angles as possible and conferences are held on all cases that do not appear to be simple. The rhythm department has detected two definite types of response, and the exercises are said to have benefited the children considerably. Every worker with children knows how much the fate of the neurotic child depends upon the parents; psychotherapeutic treatment is available for mothers and fathers at this clinic with much benefit to the whole family. A special course has been initiated to train men and women in the principles of modern dynamic psychology and remedial work. It is hoped in the future to be able to provide much more room and equipment and to develop the biochemical and record work; it is believed that valuable psychological laws are buried in the case-sheets.

AN INDUSTRIAL CLINIC.

Messrs. R. A. Lister and Co., Ltd., of Dursley, Glos., have just opened, close to their engineering works, a clinic equipped with medical and dental apparatus, and have arranged with three local doctors and two local dentists for one of each to be in attendance daily. It is not intended to compete in any way with the panel service, but it is hoped that the presence of doctors and dentists in the factory will lead to the firm's employees applying for treatment at the moment it is needed and thus avoiding dangerous delays. Incidentally by preventing avoidable ill-health the clinic should increase the efficiency of the staff of 1500 men. The scheme is the outcome of a meeting between the directors and representatives of the employees, which considered the large amount of time lost from illness or injury owing to the distance of employees' homes from the works, with consequent delay in seeking medical advice.

The medical clinic here illustrated is open during working hours, and one of the three doctors in the town attends every day from 12.30 to 1.30, or later, according to the number of patients. The attendant is an ex-chief petty officer, sick bay attendant, who deals with dressings and dispenses such things as cough mixtures. One of the directors gives examples of the way in which the clinic is reducing sickness and loss of time. A burnt arm is dressed by the attendant during the dinner hour and again before the man goes home; a visit to his doctor would have entailed temporary absence from work and the drawing of sick benefit. Two or three cases of measles recently occurred in one department of the works; every man working in this department was examined in the clinic with a view of checking a spread of infection. A man in the foundry was found to have diphtheria and swabs were taken in the clinic from the throats of the other men.

At the dental clinic two local dentists attend on alternate days, excepting Saturdays, during the luncheon hour. Their charges to members of approved societies are in accordance with the rules; to non-members slightly less than the charges made at their private surgeries, since the firm supplies equipment. Increasing numbers are visiting the clinic.



An industrial clinic.

SOCIOLOGICAL DATA FROM BIRTH CONTROL CLINICS.

A VERY thorough and painstaking examination has been made by a non-medical author of the sociological data furnished by 70,000 cases appearing in the records of 70 birth control clinics in Germany, Austria, Russia, Great Britain, and the United States.[1] The bibliography extends over 20 pages. The medical reader will find in the book no information on the comparative value of different contraceptive methods, and he will derive from it no guidance on how best to advise the patients who consult him on this subject. Hence the book will be of less interest to the practitioner than to the medical officer of health, for whom the question now arises of providing what are called "birth control facilities."

Of the sociological findings arising out of the actual clinic statistics, perhaps the most interesting is that in the United States these clinics are apparently used as freely by Roman Catholics as by persons of other religious persuasions. Thus, according to the U.S. Census of 1920 and the Catholic official Year Book of the same year, 30 per cent. of the population of New York, Chicago, Newark N.J., and Cleveland, Ohio, were Catholics. The statistics of the birth control clinics that have been working in these cities between 1921 and 1928 show that 36 per cent. of their clientèle are Catholics.

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[1] Seventy Birth Control Clinics. By Caroline Hadley Robinson. Baltimore: Williams and Wilkins Company. 1930. Pp. 351.

The general argument of the book is to the effect that birth control is not to be regarded as in any strict sense a *cause* of that fall of the birth-rate which has occurred so conspicuously in all civilised countries in the last 60 years. It is to be regarded rather as the means by which a wish has expressed itself. The *wish* to have fewer children is the essential cause of the decline in fertility above referred to, and according to the author is generated by some means (not as yet understood) by the numerical increase of population and by the consequent overcrowding which has thus arisen. That the actual practice of contraception cannot be regarded as in the proper sense causal is strongly suggested by the position in Ireland, wherein contraception is little used. That country by the extensive use of celibacy and emigration "keeps her birth-rate at the moment the lowest in all Europe, except Esthonia." Mrs. Robinson advances elaborate and well-reasoned arguments for supposing that the qualitative effects upon the population of the work of birth control clinics is not as harmful as is often alleged. This conclusion is put forward despite the unanimous opinion, fully appreciated by the author, of practically all competent British authorities that the existing birth control methods are impracticable by those classes whose fertility is likely to be the most prejudicial to society. It is possible that in this connexion conditions in England may differ from those obtaining in the United States. There are reasons for supposing that the class designated in the recent report of the Mental Deficiency Committee as "The Social Problem Group" does not exist in the United States as it does in England. Failure to distinguish, among the large proportion of unskilled labourers' wives who attend the clinics, between the wife of a bona fide worker and the wife of a more or less unemployable social parasite may have obscured an important issue. The wives of the latter are, in fact, little represented at the English clinics. This distinction is difficult to establish statistically; yet it is of the first importance in evaluating the social effects of present-day birth control.

THE USE OF STATISTICS IN MEDICINE.

DOCTOR and actuary regard life from different aspects. The actuary seeks to find out a probability factor from his experience of a great number of lives in bulk; the doctor is primarily concerned with the individual's expectation of life and the means of improving it. Nevertheless, as Mr. F. L. Collins showed at a meeting of the Medico-Legal Society recently, mortality statistics are indirectly of incalculable value to the medical profession. One of the most important factors in the awakening of the national conscience in the middle of the last century to the importance of human life and the possibility of its prolongation by improved sanitation and environment was, as Mr. Collins pointed out, the pioneer work of Farr. He was the first man in this country to apply census returns and death registers scientifically to the betterment of the public health, and the Public Health Acts, which were passed in the 'seventies, were due in large measure to the light which he shed. Mortality statistics are of ever-increasing importance to medical officers of the public service as a guide to the efficacy of their health administration, and they form the foundation of national health insurance and Government pensions schemes. To those who desire to appreciate more fully the importance of mortality tables to the life of a community Mr. Collins recommended a study of the Registrar-General's Decennial Supplement. It may be that actuarial technique will remain to the practitioner of medicine something of the mystery which the language of the pathological laboratory is to the actuary. But this does not justify the rejection of mortality tables on the ground that "statistics can prove anything." Honesty and competence ensure that statistics shall be used only as ins for discovering truths, and every fair-minded m man will grant to the actuary a measure of t qualities equal to that which he claims for himself.

INDUSTRIAL HEALTH EDUCATION.

SOME folk make a brave show with but little outside the shop front; others with an inferiority complex make but little show with much worth exhibiting. The annual report of the Industrial Health Education Society belongs to the latter category; it is laconic rather than precise. Anyone who has been present at some of the talks organised by the society knows the good work it is doing. Perhaps it may be a group of 50 to 150 coal-miners collected in a welfare hall to listen to a lecture on nystagmus, and thereafter to heckle the lecturer; or a number of tinplate workers in a village institute gathered to discuss their occupational troubles; or some cotton operatives eager to hear about spinners' cancer. The human touch is present at these meetings, bringing the scientist in contact with the object of his research; and he is learning as well as h audience the value of knowledge. Well may t society choose as its annual motto the words sp on its behalf by the Prince of Wales: "No man's work should be a danger to his health or a menace to his life." There is much room for propaganda to teach those who want to be taught how to earn a healthy life in the industries of the country. This is the work of the society, and we hope it will continue to expand.

THE ROLEX "PRINCE" WATCH.

THE Rolex "Prince" watch has been designe to introduce a new and useful feature in wrist watche The face has two dials, the upper one showing th hours and minutes, and the lower one the second The seconds dial, which is 9 mm. in diameter, can b read clearly, with all the convenience implied fo clinical purposes. One winding keeps the movemen going for 58 hours, and a compensating hair-sprin protects against irregularities of temperatures, i which connexion the firm possess a certificate o excellence by the Swiss Government Observatio Station. The watch is not unduly large, bein slightly curved fits comfortably to the wrist, and i appearance is an attractive piece of jewellery. Th price ranges from 8 guineas to 40 guineas, and th name of the nearest agent for its supply can b obtained from the Rolex Watch Co., Ltd., 40/4 Holborn Viaduct, E.C.1.

A USEFUL SAINT.

To the Editor of THE LANCET.

SIR,—I had recently occasion to investigate th exact meaning of the French word "acariâtre" (crabbed; cross-grained; waspish, &c.), and consulted the latest edition of Larousse's excellen dictionary. For the first time I see that it gives th etymology, as follows: "de Saint Acaire, qu guérissait les fous." I have consulted several histori of saints, and other large French and English encyclopædias, but cannot discover any account or even th name of the saint. As a saint who cured mad peop would have certainly an interest for medical historians perhaps one of your learned readers would help.

I am, Sir, yours faithfully,

London, April 8th, 1931. ETYMOLOGIST.

SOUTHAMPTON HOSPITALS' ASSOCIATION.—The second annual report of the Southampton and District Hospitals' Association shows that in 1930 the receipts more than doubled, and that 45,000 cards have been issued for the current year. The working expenses have been reduced from 14 to 6 per cent.

ADDRESSES AND ORIGINAL ARTICLES

QUININE THERAPY IN MALARIA.*

BY PHILIP MANSON-BAHR, D.S.O., M.D. CAMB.,
F.R.C.P. LOND.,

PHYSICIAN TO THE HOSPITAL FOR TROPICAL DISEASES; LECTURER
AT THE LONDON SCHOOL OF HYGIENE AND
TROPICAL MEDICINE.

THERE is nothing more perplexing to the average student of tropical medicine than the varied and often totally contradictory ideas regarding the exhibition of quinine in malaria. For the last 300 years physicians of all nations have agreed that quinine in some form or other is specific for malaria fever, and since the discovery of the plasmodium it has been generally conceded that it exerts a parasitotropic effect upon the parasites of that disease. In fact the action of quinine upon malaria is cited in most text-books as a classical example of the specific and highly specialised drug action upon a particular parasite. But all physicians are by no means agreed upon the principles and methods of its practical application. There have been periods, as, for instance, during the war, when heroic and massive doses of quinine were given with the idea of extirpating *in toto* the plasmodium from the human body, whilst neglecting, or even disregarding, its subsequent deleterious effects upon the organism as a whole. After the armistice saner ideas again prevailed, since it has been realised that the main objects of annihilation have not been obtained by heroic dosage, and since it is held by some that massive quinine therapy does not only not prevent relapses but may actually predispose towards them.

VARYING RESISTANCE OF PARASITES.

When considering quinine therapy in malaria it is necessary to bear in mind that there are three species of malaria parasites, causing three clinically distinct diseases. These parasites also differ one from another in their amenability to quinine. The benign tertian and the subtertian are the most generally distributed and therefore the most frequently encountered in general practice, while the quartan is by far the most infrequent as a cause of illness and disability. It may be stated in general terms that the subtertian fevers re the most amenable to quinine therapy and that he benign tertian and quartan are much more efractory. By this statement is meant that, though the more pressing symptoms disappear when quinine is absorbed into the blood stream, yet a residuum of parasites escape or are rendered refractory to the drug and form the nucleus from which relapses may arise, often at long intervals after the primary attack. therefore propose to discuss this matter further from my personal experience in the practical treatment of malaria rather than particularly to review the experience of others.

First I would state my belief that, as in other protozoal infections in man, the primary attack is more susceptible to treatment than are relapses. This means to say that it is possible to extirpate the infection in the human body by the energetic, prompt, and timely exhibition of quinine, but that in each subsequent relapse the parasites are more resistant to the drug as they become more accustomed to its presence. Every tropical physician can point to individual cases of malaria in which a *therapia magna sterilisans* appears to have been brought about by quinine.

There is one other point—a very important one—which is often lost sight of, and that is the resistance of the human body to infection. In addition to specific therapy every other adjuvant must be enlisted to augment the *vis medicatrix*. This is the underlying factor in the apparent failure of quinine therapy, especially in benign tertian infections in a debilitating tropical climate where the body resistance is lowered by constant exposure to heat and, it may be, to superadded tropical infections. We are all familiar with the virulence which malarial infections assume in times of war, national stress, and famine. The removal of a patient from a hot steamy atmosphere to a temperate and dry climate not only increases the bodily resistance of the patient and renders him less liable to serious manifestations, thereby making quinine treatment more effective, but it also very materially shortens the life of the parasite in the human body. It has been sufficiently proved in recent years that the different malaria parasites have a limited life-span in the human body; they cannot live a limitless existence, as is popularly supposed. The life of a benign tertian infection in a temperate climate is probably one of three years, that of the quartan perhaps even longer, whilst that of the subtertian is by far the shortest of the three, and is probably under one year from the time of primary infection. So great a factor is this effect of climate that some benign tertian infections in Europeans in the tropics appear to be totally refractory to quinine.

Methods of Administration.

The salts of quinine which are commonly used in practice are: the sulphate, soluble in 800 parts of water; the hydrochloride, soluble in 40 parts; the bihydrochloride, soluble in 1 part; and the bisulphate, soluble in 11. Another salt-quinine, the ethylcarbonate, containing 81 per cent. of the alkaloid, has the advantage of being practically tasteless—an important factor in the case of ladies and children. It has the advantage of being readily absorbed, whilst other so-called tasteless preparations, such as the tannate and carbonate, are practically useless on account of their insolubility. The hydrochloride is generally regarded as the most useful preparation for general use, whilst the more soluble bihydrochloride is held in reserve for intramuscular and intravenous medication.

The most favourable moment to administer quinine during the actual attack of malaria has been the subject of speculation. It is no longer regarded as dangerous to exhibit quinine when there is a degree of pyrexia, but it is, I think, generally agreed that the drug exerts its maximum effect if given when the acute paroxysm is declining and when the patient is beginning to perspire, for at that moment the parasites have sporulated and the merozoites are free in the blood-plasma and in a condition in which they are most susceptible to the action of quinine.

Many methods have been advocated to mask or remove the bitter taste of quinine. An agreeable and efficacious method is to prescribe it in an effervescing mixture with citric acid grs. 10, to which are added grs. 4 of ammonium carbonate and grs. 20

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* Lecture delivered at a meeting held at the Wellcome Historical Medical Museum, London, in celebration of the three hundredth anniversary of the first recognised use of quinine by Europeans.

of potassium bicarbonate. Quinine is rendered less bitter if dissolved in milk, whilst syrup of orange and glycerin disguise the taste, and a practical method of cleansing the mouth is to chew a piece of bread.

Occasionally, when given in large doses, quinine may produce deafness and amblyopia, which may prove very persistent and occasionally permanent. The amblyopia is due to spasm of the arterioles of the retina and the deafness to the direct action of quinine upon the auditory nerve. Quinine idiosyncrasy or quinine intolerance is occasionally met with, and may be a most disturbing factor. In some people even minute doses of quinine may produce a profuse and most irritating urticaria, in others intractable dyspepsia, whilst in others, again, a rare, but genuine, quinine hæmoglobinuria has been noted. A useful method of determining quinine idiosyncrasy has been described by Dawson and Garbaile, who have shown that if a solution of 1 : 10 quinine is applied to a scratch on the forearm a zone of œdema and erythema immediately appears in a susceptible person.

Benign Tertian Malaria.

The most dramatic results of quinine therapy are seen in this form of malaria; so striking are the cutting-short of the fever and the disappearance of the parasites from the blood stream that the effect of quinine upon the temperature curve is often used as a method of differential diagnosis from other fevers, in the absence of a microscopical examination. Whatever the exact explanation may be, it has been established as a scientific fact that quinine has a selective action for the trophozoites of this infection and a much less marked action upon the sexual forms. This phenomenon is much more striking in subtertian infections.

A benign tertian malaria attack is usually ushered in with a rigor and a high temperature. Vomiting is not usually a special feature, so that quinine may be readily exhibited by the mouth. Directly the patient commences to perspire the first dose should be administered, and to promote sweating it is advantageous to combine it with grs. 10 of aspirin. For an adult male European the optimum daily dosage, as laid down originally by Manson (a rule which is followed at the present day), is grs. 30 divided into three doses of grs. 10 each. There appears to be no special advantage in giving larger doses than this, but I have frequently observed that smaller doses, such as grs. 15 daily, do not control the fever nor cause the parasites to disappear from the circulation. The maximum dosage should be kept up for four days and then dropped to grs. 20 daily for the next week. I am convinced that the generally held belief that it is only necessary to exhibit quinine for a short period after the fever attack is a great mistake and actually predisposes towards further relapse, so that it is necessary to institute an anti-relapse treatment. Personally I favour the method of giving grs. 10 daily for six weeks after the more massive treatment described. Others, I know, favour the week-end treatment, which consists of grs. 15 daily for three days in the week. The underlying principle is to extirpate the last remaining malaria germ in the system by daily bombardments with quinine. Unfortunately this desideratum is by no means always obtained.

Smaller doses of quinine are given to women, the maximum being grs. 20 a day, whilst children tolerate the drug well; one-twentieth of the adult dose should be given for each year of age, so that a child of 5 years would receive one-quarter of the adult dose.

It is to be regretted that even by continuous qu therapy the prevention of subsequent relapses be absolutely guaranteed; as James has shown, th may occur from nine months to one year after th apparent cure of the infection. To avoid this disagreeable possibility the resistance of the body should b built up by good food, fresh air, and moderate exercise. There is some reason to suppose that salvarsan ha some action on the parasite in the quiescent stage or at least exerts a definite tonic action on the bod I am therefore in the habit of giving one or injections of neosalvarsan 0·3 g. as an adjuvant to quinine therapy. Iron and arsenic tonics are frequently given with the quinine. Of one thing I am certain, and that is that quinine does not exert its maximum effect unless the intestinal tract is in a receptive state for its absorption. Therefore it necessary to combine quinine therapy with a aperient such as Epsom salts, which should be give at the commencement of quinine and subsequent once or twice weekly.

Although intravenous and intramuscular quinine injections may on occasions be useful in comb especially virulent benign tertian infections, yet is no evidence to show that the course of the is necessarily shortened thereby. I am convin that only small doses of quinine are indicated malarial cachexia; it is much more advisable to gi suitable arsenical tonics and iron injections than t resort to continuous drenching with quinine.

Subtertian Infections.

Subtertian malaria infections may run a very course or may be extremely severe. The para differs from that of benign tertian mainly in rapidity with which it multiplies and in its mode reproduction by sporulation in the smaller cap which by these means may be completely blo with masses of parasites and blood stasis may produced. It is a curious fact that the trophozoi are extremely susceptible to the action of even in small doses, while the sexual forms, crescents, are extremely resistant. Thus it is com paratively easy to control the more urgent signs an symptoms with relatively small doses of quinine, y when the patient is recovering and the fever quiescent, crescents may be found in numbers in th blood stream and may persist for several weeks. fact it is extremely difficult to extirpate the with quinine. I have records of cases in whi crescents persisted in the blood for 28 days af grs. 840 of quinine had been absorbed. When th is no persistent vomiting or other contra-indicati quinine should be given by the mouth in subt malaria. It is not necessary to give such large d as in benign tertian; the dosage should commen with grs. 15 of the alkaloid in solution and gradua increase to the maximum of grs. 30 daily. But very severe toxic cases in which there has been considerable degree of blood destruction with co sequent anæmia, great caution has to be observ in "pushing" quinine on account of the liability blackwater fever; the dosage should therefore beg with grs. 5 daily and gradually increase.

In the more severe clinical forms with bilio vomiting, and maybe with delirium, quinine giv by the mouth does not suffice to control sympto and resort must be had to intramuscular injecti which in such circumstances appear to act like charm. The bihydrochloride salt should be use The whole rationale of intramuscular quinine has bee much discussed. It is unquestionable that whe ever or wherever quinine comes into contact wi muscle-fibre it causes a degree of necrosis, so that the dosage of quinine must be carefully gauged and the site of injection selected. The proper dosage for quinine injection is about grs. 10 and the site of injection the gluteus maximus muscle. I am very averse to multiple quinine injections and daily injections, and I cannot see that they are therapeutically indicated. I consider three or four injections weekly ample. *It is hardly necessary to state* that quinine injections, especially if given into a limited area and at frequent intervals, are not without danger. They may produce profuse necrosis and even (in the absence of any specific microbic infection) profuse suppuration and tetanus. I have seen cases uncontrolled by blood examination (and they should invariably be so controlled) treated by continued injections in the belief that they were controlling fever, when all the time the rigors were brought about, not as had been supposed by a particularly resistant parasite, but by the continued absorption of pus from minute intramuscular abscesses.

Intravenous injections of quinine are indicated in the so-called pernicious forms of subtertian malaria, especially when the sporulating parasites are congregated in the capillaries of the brain, producing coma, or in the coats of the intestines producing choleraic diarrhœa or other forms of abdominal disease. The rapidity with which intravenous quinine acts in these dramatic states is remarkable. The bihydrochloride salt should be used, in a dosage of grs. 10 in 10 c.cm. of distilled water, injected into the median basilic vein. There is no indication for more heroic doses than this, as larger quantities are very apt to bring about too great a dissolution of the parasites and dangerous symptoms may ensue. It is much safer to give smaller injections of quinine—grs. 3 each—at frequent intervals. As it has been shown that intravenous injections of quinine are apt to be followed *by a fall of blood pressure, it is advisable to combine* it with the injection of ♏ 5 of a 1 : 1000 solution of adrenalin.

Quinine by enema has been advocated, especially for treating subtertian infections in children. It is given in grs. 10 doses, using milk or starch (4 oz. with 3 drops of tincture of opium) as a menstruum, but there is no evidence that much of the drug is absorbed.

Subtertian infections are more easily cured by quinine than are benign tertian, so that it is not necessary to give such a prolonged course of anti-relapse treatment, and I am convinced that often in this disease the desideratum of *therapia magna* is attained. However, in general the main scheme of quinine therapy *should* be followed.

Blackwater Fever.

Does quinine produce this catastrophe or predispose towards it, or does it *not*? I confess I find it more difficult than ever to answer this question. To my mind it is unquestionable that blackwater fever is an accident which occurs only in subtertian infections *and not in the other two forms of malaria. In many* cases I have noted that the exhibition of massive doses of quinine (by this I mean grs. 20–30) does certainly seem to precipitate the attack, and I have *learnt to be especially suspicious of those cases of* subtertian malaria who are obviously ill, whose spleens are greatly enlarged, but in whose blood relatively few parasites are to be found. It may be *that quinine is but one of the factors that predispose* towards the blackwater state—there may be others, such as cold, alcohol, or the toxins of some other disease—or it may be that quinine in certain individuals brings about in the red corpuscles a state of greater susceptibility to hæmolysis. At any rate it must be borne in mind that the rôle of quinine in the production of blackwater fever is very widely believed. Suspicious cases *of subtertian infection* should therefore be treated with great circumspection, graduated quinine dosage being combined with alkalis and with a liberal supply of glucose.

Quartan Malaria.

In quartan malaria large doses should be used and the maximum dose of grs. 30 should be persisted in longer than in benign tertian, as quartan parasites are much more resistant to the action of quinine than the other two, and parasites can be demonstrated in the blood for ten or more days after the initiation of quinine therapy. The question of anti-relapse treatment is also important, as quartan is by far the most persistent infection and relapses may occur over as long a period as five years. The tendency of quartan infections to be associated with nephritis should also be noted, and it has been shown that the appearance of albumin in the urine in this infection is an indication *for pushing the quinine dosage.*

The Newer Compounds.

In attempting to synthesise quinine in the laboratory Schulemann, Schönhofer, and Wingler some seven years ago produced a derivative of quinoline which is now known as plasmoquine. The probable action of this compound on malaria in man was gauged by its comparative action upon the plasmodium of birds (canaries artificially infected). Roehl and Hörlein were the better enabled to do so as it had already been shown by Sergent and Giemsa that quinine acted upon the plasmodium in the birds' blood in the same way as it did upon the human malaria parasites. Plasmoquine, in doses of 0·06 g. (gr. 1) daily, caused *a rapid* disappearance of benign tertian parasites from the blood of man, but had a lesser effect upon the ring forms of the subtertian parasite. Most remarkable, however, is its marked selective action upon the *sexual forms*. The *benign sporonts disappear* almost immediately, whilst the otherwise refractory crescents disappear in about four days after a total of 0·24 g. of the drug, so that in plasmoquine a new malaria specific has undoubtedly been discovered. But there are cogent defects in the drug. The doses originally advocated—0·25 g. and 0·12 g.—were obviously far too large and were often accompanied by alarming toxic symptoms, such as a livid blue cyanosis of the lips and nails, which is due to the conversion of hæmoglobin into methæmoglobin. Moreover, its inability to control subtertian fever was disappointing.

It was then demonstrated by Schulemann and Memmi that not only was the therapeutic action of plasmoquine greatly enhanced but its toxic manifestations were greatly diminished, or rather neutralised, by the addition of a small amount of quinine. Hence the composition of plasmoquine compound. Each *modern tablet of plasmoquine* compound contains 0·01 g. (gr. 1/6) of plasmoquine with 0·125 g. (grs. 2) of quinine sulphate. The scheme of dosage is to give the drug in full doses of six tablets daily for one week (*i.e.*, *plasmoquine gr.* 1 and quinine grs. 12 daily) with three days' interval between each weekly course for five separate weeks, as an anti-relapse treatment. I believe that plasmoquine compound is *a useful adjuvant to quinine treatment and in many* circumstances an efficient substitute. It is easy to take, and is comparatively tasteless. Many people can tolerate it who are intolerant of quinine in ordinary therapeutic doses. It is in my opinion more efficacious in controlling benign tertian malaria than is pure quinine; it frequently cures an infection which appears resistant to pure quinine. It banishes the crescents from the blood in subtertian malaria. In appropriate doses it is readily taken and readily absorbed by children and it is readily borne by pregnant women, in whom it controls the fever while it does not predispose to abortion, as does pure quinine. I have had several cases of intractable malaria in pregnant women who have gone to full term on plasmoquine therapy without any further attacks. Manifestly plasmoquine has attained a distinct place in our armamentarium against malaria, and it has opened up vistas by the exploration of which less toxic and even more specific antimalaria drugs may be obtained.

ACUTE DISSEMINATED ENCEPHALOMYELITIS:

ITS SEQUELÆ AND ITS RELATIONSHIP TO DISSEMINATED SCLEROSIS.

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THIS paper is based upon a small number of cases of acute disseminated encephalomyelitis which have been observed for varying periods after the acute attack, and from these and a study of cases described in the literature certain conclusions have been arrived at regarding the association between acute disseminated encephalomyelitis and disseminated sclerosis. It is hoped that these may serve the purpose of drawing attention to this problem which, on the clinical side, presents many difficulties.

A Review.

Although scattered references to acute disseminated encephalomyelitis are to be found in papers for some years past, it is only within the last six years that the condition has attracted much attention. On the clinical side three groups of cases have occurred: (1) post-vaccinal; (2) following infectious fevers; (3) spontaneous.

Post-vaccinal.—In 1912 the histological changes of post-vaccinal encephalomyelitis were recognised, for the first time, by Turnbull in a single case. In 1926 Turnbull and McIntosh[15] reported seven cases showing the same association, in each of which a pathological examination was made. In every case the vaccination was a primary one, and symptoms of encephalomyelitis showed themselves from 7 to 12 days after the vaccination. Drowsiness, headache, and vomiting were common at the onset; there was pyrexia varying from 102° F. to 105° F. Two cases showed strabismus and three Kernig's sign, and an extensor response was present in two cases. Death occurred between the fourteenth and fifteenth days after vaccination and was preceded by increasing coma and incontinence of urine and fæces and, in some cases, by abolition of the deep reflexes. The authors mention that complete recovery was the rule in the cases which survived.

Between the years 1924 and 1928 150 cases of post-vaccinal encephalitis were reported from Holland. At first the condition was considered to be epidem encephalitis and it was thought that the dis had been lit up by the vaccination, but subsequentl this view was generally abandoned, chiefly because th incidence of encephalitis was steadily dim during the years 1926 and 1927, at a time when pos vaccinal encephalitis was reaching its zenith. In t cases the clinical picture was similar to that seen England, as exemplified in Turnbull and McIntosh paper. In adults headache, fever, and paralysis the extremities, with sphincter disturbances, exten plantar responses and, as a rule, depression of th deep reflexes, were not uncommon. The mortali in the Dutch and English cases varied betwe 25 per cent. and 50 per cent. In those who s recovery was usually rapid and remarkably compl

Following Infectious Fevers.—Of the inf fevers measles seems to be the commonest of encephalomyelitis; varicella and mumps precede it. Greenfield,[4] in a recent paper, descri four cases following measles, two of which were fat The following is a résumé of one of these cases was under the care of Dr. Gordon Holmes.

A girl, aged 6, showed a measles rash on March 7th, 1 On March 31st she appeared drowsy and was seized w generalised convulsions which occurred at regular intervals there were, also, other attacks characterised by clo movements involving the right side of the body. La on in the same day she became semi-stuporose and Che Stokes respirations were noted. On April 1st she was drowsy; a flaccid paresis of the limbs on the right side noted as well as incontinence. There were no signs. On the same day the temperature rose, the movements became generalised, and she died.

Another case showed a similar picture, whilst another meningeal signs were prominent. In following case recovery took place.

A female, aged 24, under the care of Dr. James C was taken ill with measles on May 25th, 1928. On June she had retention of urine and during the next 24 h gradually lost all feeling in the legs as high as the becoming completely paralysed. No voluntary mi or defæcation were possible; she showed a complete flac paraplegia. The upper abdominal reflexes were but the lower were absent; apart from a diminution vibration sense in the legs, sensation was normal. The reflexes in the lower limbs were absent; the p responses were flexor. The cerebro-spinal fluid showed material change from normal. By June 15th she h greatly improved and was able to stand and walk feebl the deep reflexes had now returned. She subsequen appeared to make a complete recovery.

Wohlwill[16] has described two cases.

In the first a child aged 4, on the fourth day after appearance of a measles rash, became stuporose and sho myoclonic movements of the upper limbs with a fla paresis of the lower limbs, diminished reflexes, and a positi Babinski's sign. The temperature was 105° F. T cerebro-spinal fluid contained 400 cells per c.mm. Th days later the child became comatose, and it died following day.

In a second case, a child of 4, the symptoms were v similar but meningeal signs were present.

Further references to cases in the literature may found in Greenfield's paper.

Greenfield refers to the cases in which the spi cord is chiefly involved: "The paralysis, which usually flaccid, tends to become spastic after the fi few days with increase of the deep reflexes and extensor type of plantar response; here, too, t recovery is remarkably complete. . . This picture temporary paraplegia with loss of sphincter cont and incomplete or dissociated anæsthesia is characteristic of the myelitis following measles th the few cases in which the paralysis has been of anoth type may be discounted." A review of the cas reported in the literature bears out this observation.

Greenfield [6] has also published two fatal cases of encephalomyelitis following "influenza."

In the first case broncho-pneumonia was present from the onset. The second was as follows: a male, aged 32, was taken ill on Feb. 3rd, 1928, with headache and indigestion; the temperature was 100° F. On Feb. 4th he had severe frontal and occipital pain. Two days later, on attempting to move his legs, he found himself paralysed; he also had retention of urine and burnt his foot on a hot-water bottle. On Feb. 13th the cranial nerves and upper limbs were normal; there was a flaccid paralysis of the lower limbs with loss of thermal and pain sensibility up to the level of Poupart's ligament; vibration, postural sensibility, and touch were normal. The knee- and ankle-jerks were absent; plantar responses could not be obtained. The cerebro-spinal fluid showed 17 cells per c.mm. and 0·06 per cent. of protein; the Wassermann reaction was negative. On Feb. 16th he developed a cystitis; the knee-jerks were now feebly present and sensation began to return two days later. On Feb. 25th he died of pyelitis and bed-sores.

Histologically both these cases proved to be typical disseminated encephalomyelitis. There seems little reason to associate the word "influenza" with the second case which, from the clinical description, appears to have been one of spontaneous encephalomyelitis.

Spontaneous Encephalomyelitis.—In 1927 Redlich [12] published an account of 12 cases which he had observed between 1924 and 1927. Three-quarters of the cases were in persons under the age of 30. The onset in every case was between the months of January and June and was usually sudden. Fever was present in four cases, and absent in four, and in the remaining four cases no mention was made of this symptom. Pain was a prominent feature in about half the cases; it was referred to the trunk and limbs and was sharp and shooting. Paresis in the lower limbs, varying in degree, developed within the first two or three days, except in a few cases in which its appearance was delayed for a week or so. In nearly every case some temporary paresis of sphincter control was noted. Nystagmus and varying degrees of ataxia were present in approximately half the cases; a single or double extensor response was noted in all but two cases. Sensory disturbances in the lower limbs and on the trunk occurred in about half the cases; in three of these the loss was more marked on, or confined to, the lower limb and the corresponding side of the trunk. Redlich lays emphasis on this tendency to a Brown-Séquard syndrome. In only one case were signs of meningitis found. Diplopia was rare; facial paresis occurred in one case and the relative escape of the cranial nerves was noteworthy. In seven cases no fresh symptoms or signs developed after the first three weeks. In the remainder relapses occurred at intervals of some months. In approximately half the cases residual signs such as nystagmus and extensor responses remained.

Redlich believed that these cases, many of which resemble acute disseminated sclerosis, can be distinguished from this disease on the following grounds: (1) Cerebral signs in acute disseminated sclerosis are more pronounced than in his cases, and retrobulbar neuritis, which is common in disseminated sclerosis, did not occur in a single case. (2) Although, perhaps, a Brown-Séquard syndrome may be met with in disseminated sclerosis, in his experience it occurs in the later stages of the disease and not in the acute phase, as in his cases. (3) Relapses in acute disseminated encephalomyelitis are exceptional.

Three cases occurred in persons over the age of 40, and in each of them the posterolateral regions of the cord were affected. Redlich alludes to the resemblance of these cases to funicular myelitis associated with pernicious anæmia; he states that none of them showed any signs of pernicious anæmia, but no details of the blood and gastric findings are given. Two of his cases were as follows:—

CASE 1.—A female, aged 16, was seized, during the middle of March, 1924, with sudden sharp pains round the waist. Two days later numbness and tingling appeared in the feet and stiffness in the legs. Three days later pains were felt in the legs and she had retention of urine. The temperature was *slightly raised. On March 27th the* cranial nerves were normal. There was a slight tremor of the upper limbs on voluntary movement. A marked degree of spastic paraplegia was present, with double extensor plantar responses. There was anæsthesia to all forms of sensation below the tenth dorsal segment. The cerebro-spinal fluid was negative. By April 7th active movements had begun to return in the legs and the anæsthesia was less marked. Later, bladder control returned, as did the power in the left leg. There remained a moderate degree of paresis of the right leg. Sensation returned, except for a strip of anæsthesia between the tenth and twelfth dorsal segments; a slight tremor of the right hand was still present. The abdominal reflexes returned later. In February, 1927, she walked well and was able to climb hills, but the plantar responses remained extensor. No fresh signs were noted.

CASE 7.—A boy, aged 11, was taken ill in September, 1925, with a sore-throat followed by weakness in the legs on getting up from bed. After a few weeks he complained of pains in his legs and his writing became uncertain. Walking improved, but early in 1926 it became worse again. In June, 1926, there was no nystagmus and the optic discs were normal. Speech was slightly nasal. There was slight ataxia on the finger-nose test, but no intention tremor; both lower limbs were moderately paretic and the gait was ataxic. The plantar responses were extensor; there was no pes cavus. Sensation was intact. The cerebro-spinal fluid showed a negative Wassermann reaction, one cell per c.mm., and a normal colloidal gold curve. He was discharged from hospital in October, 1926, when the signs were still present.

Flatau,[3] in 1929, described 17 cases observed in Poland during the year 1928 which showed disseminated lesions of the central nervous system. The onset was sudden; the initial symptoms were pains and various paræsthesiæ such as a pins-and-needles sensation or a sense of constriction, accompanied or soon followed by weakness in the limbs and often by a mild fever. In one case there were dysphagia and dysarthria. The seventh cranial nerve was involved in several cases and vision was affected in a few, usually bilaterally. Incontinence of urine was a frequent and early symptom. There was little or no disturbance of sleep. In some cases there was weakness of all the limbs, but more usually a varying degree of paraplegia, though sometimes the paresis assumed a hemiplegic distribution. In a few instances muscular atrophy appeared. In about three-quarters of the cases there were signs of pyramidal tract involvement. In one case only were the deep reflexes in the lower limbs abolished. Objective sensory loss was rare, thermal sensibility being diminished below the waist in one case and in another on one arm. Two cases proved fatal; the remainder rapidly improved. No information is given as to the subsequent findings. No mention is made of nystagmus or ataxia in the clinical description of the cases.

Brain and Hunter,[2] under the title "Acute Meningo-encephalomyelitis of Childhood," described six cases in which the most striking features were: (1) the age varied from 3 to 18 years; (2) all the patients developed their symptoms between April 16th and May 28th, 1928; (3) the onset was acute and fever was present in each case, ranging from 99·4° F. to 105° F.; (4) meningeal symptoms were present in all but one case. In two cases meningitis constituted the only neurological sign, but in the remainder evidence either of involvement of the cerebrum, such as hemiplegia and aphasia, or of the spinal cord, such as weakness in the lower limbs, was present in addition. One case showed trismus; this has been noted in some of the post-vaccinal cases. One case proved fatal; the remaining cases, despite the severity of their condition, recovered completely in a comparatively short time. In every case the cerebro-spinal fluid was normal.

Martin,[7] in reporting four cases observed in London during 1928, laid emphasis on the fact that in each case the symptoms suggested a widespread infection of the central nervous system. They came on in a series of attacks, different parts of the cerebro-spinal axis becoming affected suddenly at different times. Two of his cases died, one made a complete, and the fourth a partial recovery.

Spiller[13] has recently reported two cases of which the second may be cited.

> A man, aged 34, on Oct. 6th, 1924, complained of numbness in the feet which in four days had ascended as high as the hips. During the night of Oct. 11th he experienced severe pains on the right side of the chest and later at the same level on the left side. The spinal fluid showed an increase in the cell count. By Nov. 10th paræsthesiæ were felt in the right hand and right side of the face. Walking caused fatigue; there was no fever. Dysphonia and dysphagia developed; there was no diplopia. The patient came under observation on Nov. 20th, 1924. Speech was nasal and the soft palate was paralysed bilaterally; thermal sensation was impaired on the left side of the face. Nystagmus was present on looking to the right. The abdominal reflexes were absent. Pain and thermal sensibility were greatly impaired in the left upper and lower limbs and left side of the trunk. The limbs were not paralysed but tired easily on exertion; both plantar responses were flexor. The patient was too ill for more careful examination and died two days later. The histological examination showed changes fairly typical of acute disseminated encephalomyelitis.

Strauss and Rabiner[14] described under the title "myeloradiculitis" six cases which from their description seem to have been cases of acute disseminated encephalomyelitis. Pains in the trunk and limbs, followed by a rapid onset of flaccid paraplegia in the lower limbs with absent deep reflexes, segmental sensory loss (chiefly thermal), and sphincter disturbance were the commonest findings. In all there was rapid recovery.

Further papers dealing with the same subject have been published by Pette,[11] Montzka,[8] and others.

PATHOLOGY.

A survey of the pathological findings in the fatal cases, whether occurring after vaccination (Turnbull and McIntosh, Perdrau[10]) after infectious fevers (Greenfield), or spontaneously, leads to the conclusion that the histological picture is essentially the same in all. It may be summarised as follows.

1. The lesions are disseminated, being found in both brain and spinal cord. In the majority of cases the white and grey matter are about equally affected.

2. The essential lesion consists of a perivascular zone of demyelination, which may be discrete or of considerable size.

3. Perivascular cellular infiltration varies greatly in its intensity; in a few cases it has been absent. In many cases there is a broad zone of cells outside the adventitia which extends for some distance into the surrounding tissue, quite unlike the closely packed "cuff" so characteristic of epidemic encephalitis. Lymphocytes, plasmacytoid, microglial and endothelial cells may be present. The pons, medulla, and lumbar regions of the cord are specially attacked (Turnbull and McIntosh, Perdrau); this again helps to differentiate the disease from epidemic encephalitis, in which the site of predilection is th mid-brain. Greenfield, in commenting on the histological appearances in two cases of "influenzal encephalomyelitis, states: "The similarity of th lesion in these two cases to those of encephalomyelit which follows vaccination and small-pox is remarkab close." He might also have added measles, as own work shows. "Slight differences may be f in the type of cellular reaction in the lesion, but th must of necessity vary according to the length the period between the onset of the lesion and death. Perdrau comes to the same conclusion.

SUMMARY OF CLINICAL PICTURE.

The disease sets in abruptly in an otherwise h person. Fever is often present and is particularl marked in children; in adults it may be a throughout. In children headache and meninge signs are common. Highly characteristic of disease is the manner in which fresh ne symptoms appear, usually within the first three wee but in rare instances up till some few months fro the onset. Another and striking feature is th rapid recovery which takes place even in case which have shown evidence of severe involvemen of the central nervous system; this recovery i usually complete, but in some instances cert sequelæ may remain. The mortality is low in th spontaneous cases but higher in those which follo vaccination and the infectious fevers.

It would be possible to classify the various of encephalomyelitis according to the part of neuraxis mainly affected. However, the dissemi nature of the pathological process might be lost sig of and no good purpose would serve such classifica It is obvious, however, from the reported cases the main incidence of the disease may fall on cerebrum or spinal cord.

In the *cerebral* type, which perhaps occurs m frequently in children, meningeal symptoms an signs are frequent and may constitute the who clinical picture. Convulsions are general and may occur at the onset and during the acute phase stupor amounting to coma has been frequently Focal signs, such as hemiplegia, hemianopia, aphasia, have been often observed. In fatal coma becomes increasingly deep. Recovery may complete, but in a few cases hemiplegic signs m remain.

In the *spinal* type pain is an early and s feature. In some cases the pains may be to one part of the trunk; frequently they are m generalised. They are described as sharp or sho and are extremely severe; they may last some ho or days. Other forms of paræsthesiæ are comm such as numbness or a pins-and-needles sensation, a sense of constriction, usually in the limbs or low trunk.

Motor weakness in the lower limbs which rapidly progress to a complete loss of power is usua noticed within a day or two of the onset, but in oth cases not until the end of two or three weeks. Th paresis may be accompanied by an increase of d reflexes in the lower limbs with an extensor plant response. In other cases all the deep reflexes ma be absent with an extensor or equivocal plant response. In one of my cases the knee-jerks wer abolished while the ankle-jerks were exaggerated both plantar responses were extensor. Distur of sensation probably occur in about half the case There may be a diminution of all forms below certain level; more usually the lower limbs affected unequally and certain forms of sensation are impaired more than others. This particularly applies to heat, cold, and pain sensibility (see personal Case No. 1). Sphincter disturbance, from a slight difficulty in starting micturition to complete retention, is nearly constant and is usually an early sign.

To this purely spinal cord picture may be added signs indicating implication of the brain stem. The commonest of these are nystagmus and ataxia in the upper limbs. I have noticed that the nystagmus in this disease is extremely rapid and fine, but as I have seen so few cases I do not wish to dogmatise on this point, although, if confirmed by others, it might serve as a useful differential point between this disease and disseminated sclerosis, in which the nystagmus is less rapid. A unilateral or bilateral ataxia may occur, usually most marked in the upper limbs. Redlich, in his original paper, remarks on the comparative escape of the cranial nerves in this disease, and in the main the reports of others seems to bear this out. Particularly striking is the escape of the upper cranial nerves; *diplopia is extremely rare.* The optic nerve, which, as Paton[8] has recently reminded us, is a tract of white matter in the central nervous system and therefore subject to the same pathological changes that occur in the white matter elsewhere, is rarely affected and then, as a rule, bilaterally, resulting in a sudden fall of vision. In such cases the diagnosis of neuromyelitis optica, a disease characterised by bilateral diminution of vision and signs of a myelitis and which has been considered by some to be a separate disease from disseminated sclerosis, is likely to be made. A facial palsy has been reported in some cases, as also have bulbar symptoms such as dysphagia and dysphonia.

Changes in the cerebro-spinal fluid are infrequent. In the cases showing meningeal signs there may be no cellular increase; in other cases a moderate increase in the lymphocyte count may be found. The Lange gold curve is not mentioned in many reports; on the whole no change has been noted.

Sequelæ.

I have not met with any article dealing with the sequelæ of acute disseminated encephalomyelitis. The following four cases show sequelæ of varying severity.

CASE 1.—A female, aged 14, was admitted to the Hospital for Epilepsy and Paralysis, Maida Vale, on Dec. 22nd, 1927. On the morning of Dec. 6th she had had two teeth extracted under *novocain. The same afternoon* she suddenly "felt shaky all over" and could not walk straight; she "staggered all the way home." On the next day the right arm, right side of the trunk, and right leg felt numb and a few hours later she noticed weakness in the right hand and right leg, especially in the latter. On Dec. 8th the numbness disappeared from the right arm but remained in the right leg for several days. She was unable to walk owing to weakness in the right leg. On Dec. 15th the left leg and left side of the abdomen became numb, but the power in this leg *remained normal.*

On admission to hospital there was no obvious euphoria. The pupils were equal and reacted normally. A very fine, rapid nystagmus was present on looking to either side. The discs were normal, as were the remaining cranial nerves. There was a slight paresis of the right upper limb, especially distally, and the deep reflexes on this side were exaggerated; no sensory loss could be detected. None of the abdominal reflexes could be obtained. A marked degree of weakness of the right foot was present; the movements at the right knee-joint were slightly less affected. The right knee-jerk was brisker than the left; there was right ankle-clonus. The power of the left leg was good. The right plantar response was extensor, the left flexor. Sensation was diminished on the left leg and left side of the trunk up to the level of the seventh dorsal segment; pin-prick, thermal and pain sensibility were chiefly affected, cotton-wool and vibration sense to a lesser extent. At a later date, tactile sensation became normal. In the cerebro-spinal fluid the Wassermann reaction was negative, the total protein was 0·025 per cent., and the cells 1–3 per c.mm. The Lange gold curve was normal.

The condition gradually improved, but on her discharge on March 18th, 1928, there was still considerable weakness of the right foot, especially of dorsiflexion, and slight weakness *of the right hand. The sensory loss remained as before.*

On April 8th, 1929, no fresh symptoms had developed; fine rapid nystagmus was still present; the left leg still dragged on walking and there was no further appreciable return of power; no weakness of the right arm could be detected. The abdominal reflexes were still absent. Pain and thermal sensibility remained definitely diminished below the seventh dorsal segment on the left side; vibration sense was equal on the two sides and other forms of sensation were unaffected.

On Oct. 3rd, 1930, the patient stated that she had been perfectly well except for the weakness of the right leg. Fine nystagmus and a Brown-Séquard syndrome remained as before. In the cerebro-spinal fluid the Wassermann reaction was negative, the cells numbered 2–3 per c.mm., the protein was 0·03 per cent., and the Lange gold curve was normal.

CASE 2.—A male, aged 22, on Oct. 9th, 1928 "felt off colour" *and alternatively "hot and cold"* with *pains in* his limbs. The same afternoon he vomited. He went to bed and remained there until Oct. 21st. Shortly after getting up, he had acute pains of the girdle type round the waist and his legs became so weak that he fell. He had considerable difficulty in passing urine. The vision in the right eye became blurred. On the following day he again vomited, but the pains abated somewhat. Dr. E. R. Lovell, of Billericay, noted that there was nystagmus, absent knee-jerks on either side, and a doubtful extensor plantar response. *On Oct. 24th there was a recurrence of girdle pains, with* pain also at the back of the neck. On Oct. 28th the pain radiated down the right arm. Thereafter he slowly improved. He was admitted to hospital on Nov. 29th. He no longer complained of pain but felt weak and unsteady when walking.

Examination showed no obvious euphoria. Pupils were equal and regular in outline and reacted normally. A rapid, very fine horizontal nystagmus was present on lateral fixation of the eyes. There was no pallor of the discs. Articulation was normal. There was a slight paresis of the right arm with definite ataxia on the finger-nose test. Apart from a slight degree of postural defect in the fingers of the right hand, sensation was normal in the upper limbs. The deep reflexes were present and equal in the two arms. The abdominal reflexes were absent. There was a moderate degree of paresis of the lower limbs, more especially of the right, with a mild degree of hypertonus. The right knee-jerk was absent; the left was feebly present. Both *ankle-jerks were exaggerated and a double extensor plantar* response was easily obtained. Vibration sense was diminished in both legs below the iliac crest; there was a slight loss of postural sensibility in the toes; sensation was otherwise normal. Ataxia was marked and was mainly of the cerebellar type; there was no disturbance of sphincter control. In the cerebro-spinal fluid the Wassermann reaction was negative, the cells numbered 1–3 per c.mm., the total protein was 0·03 per cent., and the Lange gold curve was normal.

When discharged from hospital on *Feb. 5th, 1929,* power had improved in the lower limbs and the gait was much less ataxic. The right knee-jerk was just obtainable. The other signs remained as before. He has remained under observation and no fresh symptoms or signs have appeared. He was re-examined on Sept. 25th, 1930. Fine nystagmus and bilateral extensor responses were still present but the power in the legs was now nearly normal. The abdominal reflexes had returned and were now brisk. The knee-jerks were more active than when he left hospital in February, 1929 but were still definitely less brisk than the ankle-jerks. The cerebro-spinal fluid contained 1–3 cells per c.mm., and the percentage of protein was 0·025. The Lange gold curve was normal.

CASE 3.—A female, aged 25, was seized whilst at work at 2 P.M. on June 20th, 1928, with a severe pain which shot through the right knee and then radiated upwards towards the right groin and then downwards towards the foot. The pain was intermittent, shooting in character, and of great severity. *One hour later* a similar pain followed by a "pins-and-needles sensation" was felt in the left leg. At about 5 P.M. numbness was felt in the feet and spread quickly upwards to just above the groins, and at the same time the legs became weak. She did not micturate for about 18 hours and then had no sensation of the act. By the end of 48 hours the numb feeling had passed off, but the pains were severe for another two days. She remained in bed until the fifth day of the illness, but on getting up found that her legs were still weak.

She was admitted to the National Hospital, Queen-square, on July 17th. I am indebted to Dr. I. M. Allen, registrar to the hospital, for a note on her condition on admission: "Positive findings. Fine nystagmus to right and left. Some weakness of dorsiflexion of right foot. Pin-prick diminished right leg, especially in distribution of third, fourth, and fifth lumbar segments. Vibration sense diminished right leg. Right knee-jerk absent. Left plantar response not obtained. Abdominal reflexes very active; other tendon reflexes normal. The cerebro-spinal fluid contained one cell per c.mm., 0·045 per cent. of total protein, and no excess of globulin; the Lange test showed no change. The Wassermann reaction was negative in the cerebro-spinal fluid and blood. On July 25th both plantar responses were extensor. On July 30th the right knee-jerk was obtained and the plantar responses were indefinitely flexor. On August 20th both plantar responses were flexor but the right knee-jerk was still less than the left. On August 31st the patient was discharged with considerable improvement in motor power subjectively and objectively. Some sensory loss remained in the right leg and the right knee-jerk was still diminished."

The patient was admitted to the neurological ward of the Middlesex Hospital on August 18th, 1930. She stated that after leaving hospital in 1928 the power in the legs continued to improve but that the right leg tired easily after walking a short distance, and that at times she felt a pain in the right knee; otherwise she had been free from symptoms. On examination there appeared to be no euphoria. A rapid fine horizontal nystagmus was present on lateral fixation of the eyes to the right and left. The discs were normal. There was no weakness, tremor, or ataxia in the upper limbs. Dorsiflexion of the right foot was slightly less good than that of the left; otherwise the power of the lower limbs was good. There was no muscular wasting. The abdominal reflexes were active and equal on the two sides. The left knee-jerk was brisk and the right diminished; both ankle-jerks were active and equal and the plantar responses were flexor. There was no loss of tactile sensation on the lower limbs, but slight diminution of thermal sensibility over lumbar segments 3–5 on the right side without any appreciable loss to pin-prick. Vibration sense was slightly diminished on the right leg as compared with the left. The gait appeared normal. The cerebro-spinal fluid showed a normal Lange gold curve and no abnormality was observed.

CASE 4.—A male, aged 29, was seized one day during the third week in March, 1929 with severe pains in both lower limbs. He had to walk a distance of half a mile to his home, during which time the pains occurred three or four times. They were so severe that he thought he would faint, and were shooting in character. On reaching home he went to bed. The pains continued and spread to the back; he also had a severe headache. He remained in bed four days. On getting up he found that his legs were weak; he could just manage to walk round his room. He had no trouble with micturition. On the ninth day he returned to work but was still unable to walk properly, although he could drive his car. Two days later he noticed numbness around the knees, which spread to the ankles; this sensation disappeared at the end of a few days and a fortnight later his legs were practically well again. At the beginning of August he went on holiday; three or four days later he was seized with severe pains in his legs and again they became weak so that he had difficulty in walking. Thereafter he gradually improved, but a slight weakness of the left leg remained. At no time had he any trouble with his vision.

When seen at the Middlesex Hospital on May 3rd, 1930, he complained of fatigue in the left leg after walking about half a mile. Examination showed no euphoria or nystagmus, and normal pupillary reactions. The discs were well coloured. There was no paresis, sensory loss or ataxia in the upper limbs. The abdominal reflexes were diminished on the left side. A slight degree of motor weakness was present in the left leg, with brisker reflexes and an equivocal plantar response on this side; the right was definitely flexor. Apart from diminished vibration sense below the level of the iliac crests on either side, no sensory loss was found. When re-examined on Oct. 8th, 1930, he stated that he was able to drive his car about 80 miles a day, but was still troubled with weakness and occasional aching pains in his legs after walking a short distance. No change in the physical signs was noted except that the left plantar response was flexor, though not as definitely as the right. The cerebro-spinal fluid showed the Wassermann reaction negative, three cells per c.mm., 0·03 per cent. of protein and a normal Lange gold curve.

The diagnosis of acute disseminated encephalomyelitis seems extremely probable in each of thes cases. The rapid occurrence of a Brown syndrome in Case 1, the intense pains in the remai three cases and the abolition of deep reflexes in C 2 and 3 are points of diagnostic importance. Th sequelæ are severe in the first two cases and neglig in the remaining two. In Case 1 a Brown- syndrome remains. Case 2 now presents a pictur indistinguishable from chronic disseminated sclerosis the knee-jerks, which were absent at the outset, ha now returned. The only point which would no help to distinguish this case from one of disseminate sclerosis is the fact that the abdominal reflexes ar present despite a double extensor plantar response. Had the disease been disseminated sclerosis, th abdominal reflexes would almost certainly have bee absent. In Case 3 a retrospective diagnosis was made, based on the history and findings whilst sh was an in-patient in the National Hospital and her present condition. In this case and in Case importance was attributed to the pains at the onset which in each case were of great severity. In Case the diagnosis might be contested because of relapse three months after the onset; however, of Redlich's cases showed fresh signs after a simil period. Cases 3 and 4 show few remaining signs the symptoms consist of a certain amount of pain i the legs with undue fatigability.

Muscular atrophy is mentioned in the literatur as an occasional sequel. I have seen one such case 14 months after the acute illness, in which th diagnosis of acute disseminated encephalomyeliti was probable but, as I have been unable to obtain reliable history, either from the patient herself or he doctor, I have thought it best to omit the case.

In the cerebral type a complete recovery is not t be anticipated in every case, therefore a hemiplegi or aphasia may be expected to remain, but I myse have encountered no such case. The diagnosis i the initial stages, when the symptoms and signs ar confined to the cerebrum, is likely to be epidemi encephalitis, polio-encephalitis, or meningitis. I must be recognised, however, that fresh cases o epidemic encephalitis have been exceedingly during the past four years and that poliomyeli usually occurs only in the autumn months. It probable, therefore, that many cases of acute di seminated encephalomyelitis, particularly of th cerebral form, have been mis-labelled during th past four years and that in consequence the nature of their sequelæ has not been recognised.

Relationship to Disseminated Sclerosis.

This is a difficult question and one which it impossible to answer with our present knowled especially of the bacteriology of the two diseas However, it is of interest to consider the prob from a clinical and pathological standpoint.

Marie [6] was the first to draw attention to the clo relationship that may exist between the infectio fevers and disseminated sclerosis. He particular referred to typhoid fever, small-pox, scarlet fever, an measles. Since the occurrence of disseminat encephalomyelitis in almost epidemic form duri the past few years, sometimes as a sequel of vaccin tion and measles, there has been considerable con troversy on this point. Redlich's views have alread been cited and his reasons given for separating th two conditions. Pette, on the other hand, think that the various forms of encephalomyelitis, whic have become more frequent since the war, should be regarded as an expression of a new disease, but rather as bearing a close relationship to disseminated sclerosis. He believes that it is impossible to separate encephalomyelitis and multiple sclerosis, either from the symptoms or the pathological findings. He thought that when sclerosis was really present, multiple sclerosis could be considered as the causal condition; in other words, a diagnosis of multiple sclerosis can only be made when sufficient time has elapsed for sclerosis to form. This view-point is open to considerable criticism. Presumably those cases of acute disseminated encephalomyelitis which do not clinically recover, and ultimately die, will show sclerotic patches indistinguishable from those found in true disseminated sclerosis. A study of the type of cellular reaction in the acute stages of both conditions would be more likely to throw light on this question. Perdrau, as the result of a comparison of the histological picture in post-vaccinal encephalomyelitis and disseminated sclerosis, comes to the conclusion that the perivascular demyelination in each is essentially similar and, apparently on this finding, discussed the possibility that the agent responsible for the demyelination in these two diseases as well as in the other forms of disseminated encephalomyelitis may be the same for all of them.

This possibility might be considered, but there is another disease characterised by demyelination which, by our present standards of knowledge, has no relation to either disseminated encephalomyelitis or disseminated sclerosis—namely, encephalitis periaxialis diffusa (Schilder's disease).

Brain,[1] in a recent critical review of disseminated sclerosis, records a case which was under the care of Dr. W. Langdon Brown and which illustrated these difficulties.

A girl, aged 4, had an acute illness characterised by drowsiness, ataxia, and spastic weakness of the limbs. She made a good recovery but relapsed two years later with similar symptoms. In addition, visual impairment occurred in this attack. She again recovered, but the same symptoms returned 18 months later. She then showed bilateral primary optic atrophy, nystagmus, bilateral pyramidal signs, and slight ataxia, most marked in the left upper limb.

Brain remarks that in the acuteness of onset and severity of general symptoms this case resembled acute disseminated encephalomyelitis; in clinical features it recalled neuromyelitis optica, and in its relapsing character disseminated sclerosis. "In the face of this and similar cases, it is difficult to maintain a rigid distinction between the three groups." Disseminated sclerosis is unknown at this age; this would appear to be an exceptional case of disseminated encephalomyelitis in which immunity did not follow the first attack.

My personal belief, which is without any valid proof, is that acute disseminated encephalomyelitis and disseminated sclerosis are caused by a different virus, though they may present a very similar picture. The close resemblance between them will be apparent from the following case.

A spinster, aged 21, was seen in consultation on Dec. 17th, 1927, with Dr. C. D. Pye-Smith, of Huddersfield, to whom I am much indebted for detailed notes on her case.

On Oct. 14th, 1927, whilst at a dance, she was seized with intense giddiness followed by vomiting, which persisted for 24 hours. There was no pyrexia. On Oct. 20th there was recurrence of vomiting and blurred vision, with a "funny feeling" in the right foot. On Nov. 1st she had a tingling sensation in the left hand; ataxia was now marked, with difficulty in standing, and slight paresis of the right external rectus. The temperature was 99·0° F. On Nov. 20th she showed great improvement; there was no diplopia or nystagmus, and the gait was normal. On Dec. 4th there was tingling of the left hand and foot. On Dec. 5th she had a recurrence of acute vomiting with stiffness of the left side of the neck; the temperature was *normal*. On Dec. 6th there was violent oscillatory nystagmus in both eyes, but no diplopia. Vomiting continued; in the evening "pins-and-needles" sensation was felt in the left arm, trunk and leg, and the left side of *the face and she had* slight difficulty in starting micturition: the plantar responses were still flexor. On Dec. 17th I noted the following points. There was no obvious euphoria, but marked rotatory nystagmus on lateral fixation of the eyes and diplopia on looking to the right. The fundi were normal; there was no paresis of the limbs and no sensory loss, but marked cerebellar ataxia in all *four limbs, especially* on the left side, and an extremely ataxic gait. The abdominal reflexes were absent; the deep reflexes exaggerated *but equal; the left* plantar response was feebly flexor, the right definitely flexor. There was no disturbance of sphincters; lumbar puncture was not performed.

The diagnosis in this case between disseminated sclerosis and acute disseminated encephalomyelitis would have been difficult except for one incident in the past history which turned the scale definitely in favour of disseminated sclerosis. In September, 1926, whilst on holiday at the seaside, the patient had a very transient attack of numbness on the right side of the body and vomited several times. These symptoms lasted *about four days, and this* attack, at the time, was ascribed to sun-stroke. Subsequently she was re-examined on March 12th, 1928. Nystagmus, absent abdominal reflexes, a slight intention tremor and a less definite flexor response on the left side were the only abnormal signs. The patient remained perfectly well, playing games, &c., until June, 1930, when she complained of pain and numbness in the left forearm and the right thigh, tingling in the fingers and a tight sensation round the body in the region of the iliac crests, with a feeling of heaviness in the legs on walking. Dr. Pye-Smith, in addition to the above signs, found that the left plantar response was now definitely extensor. Since then the symptoms have again disappeared.

Differential Diagnosis from Acute Disseminated Sclerosis.

In the acute stage.—The following points may be of help in distinguishing between these two conditions in the acute stages.

1. A temperature of over 100° F. is in favour of acute disseminated encephalomyelitis.

2. Severe shooting pains rarely occur in acute disseminated sclerosis but are common in acute disseminated encephalomyelitis.

3. Diplopia, common in acute disseminated sclerosis, is rare in acute disseminated encephalomyelitis; in the latter condition nystagmus, when present, is finer and more rapid than that seen in disseminated sclerosis. Retrobulbar neuritis may occur in both conditions but is more frequent in disseminated sclerosis, when it is usually unilateral; in acute disseminated encephalomyelitis both eyes are generally affected.

4. Euphoria, which is common in early disseminated sclerosis, is rarely, if ever, met with in disseminated encephalomyelitis.

5. Sensory loss in disseminated sclerosis, when present, commonly involves postural and vibration sense: in acute disseminated encephalomyelitis thermal and, to a lesser extent, pain sensibility may be affected.

6. Loss of the deep reflexes in the lower limbs is not uncommon in acute disseminated encephalomyelitis, but is of rare occurrence in disseminated sclerosis.

The chronic stage.—The sequelæ of acute disseminated encephalomyelitis, especially in its spinal form, may resemble a chronic case of disseminated sclerosis closely, as exemplified in Case 2. If this case had not been seen in the acute stage when the deep reflexes were absent, a diagnosis of disseminated sclerosis would almost certainly have been made. The differential diagnosis must therefore in many cases rest on the history of the acute illness. The points previously mentioned may be of some help in a doubtful case. Should a relapse occur some months after the onset, then the case should be classified as one of disseminated sclerosis and treated accordingly; in others, if no satisfactory history can be obtained, it may be impossible on clinical grounds to distinguish between the two diseases; repeated examination of the cerebro-spinal fluid may afford some help. The Lange gold curve is positive in about 50 per cent. of cases of disseminated sclerosis. A repeatedly negative Lange curve in a case showing signs suggestive of disseminated sclerosis, and in which no fresh signs or symptoms have developed since the onset, would not exclude this disease, but would render the diagnosis doubtful. In such a case energetic arsenical treatment is not indicated, and the possibility that the case might be a sequel to acute disseminated encephalomyelitis should be borne in mind. Persistence of abdominal reflexes in the presence of extensor plantar responses, diminished deep reflexes, thermal sensory loss, absence of euphoria, presence of muscular wasting and a negative cerebro-spinal fluid are findings which, especially if more than one be noted in a case, should raise a doubt as to the diagnosis of disseminated sclerosis. In such a case every effort should be made to obtain an accurate history of the onset and, if possible, of the signs present at that time.

In the four personal cases mentioned in this paper no fresh signs or symptoms have been noticed since the onset, but as they have been under observation for a comparatively short time little importance can be attached to this, in view of the fact that remissions in disseminated sclerosis may last several years. Of perhaps more importance is the fact that the cerebro-spinal fluid has remained normal in all four cases. A case of Dr. G. Riddoch's mentioned by Turnbull and McIntosh is of interest in this connexion.

A girl of 21 was vaccinated on May 25th, 1921. On the twelfth day she felt ill and had retention of urine, shivering, and a temperature of 102° F. On the fourteenth day she was unable to stand or walk, had lost sensation completely below the waist on the seventeenth day, began to recover sensation and voluntary movement on the twenty-first day, but had slight spastic paresis of the lower limbs when admitted to hospital on the thirty-fourth day after vaccination. Five years later there was still defective sensibility to pain, heat, and cold in and below the ninth thoracic segment, and incontinence of urine and fæces in cold weather, or when the patient was tired.

Dr. Riddoch has kindly informed me that when he examined the patient again in April, 1930, he found that she had made an almost perfect recovery. Sensation was normal, as was control of the bladder, except when she was worried. In this case, which has been observed over a period of nine years, no fresh symptoms or signs have appeared.

Conclusions.

Within the last few years a form of acute disseminated encephalomyelitis has occurred, in 1928 in epidemic form, in this and other countries, either spontaneously or following vaccination or infectious fevers. On clinical and pathological grounds it is believed that these cases, whether occurring spontaneously or otherwise, may be due to the same virus. The final proof of this can, however, only be provided by bacteriology. The mortality is low. Except in rare instances in which relapses may occur during the first few months the acute phase generally does not exceed two or three weeks. Sequelæ may result, and may be extremely varied in their clinical aspects. In such cases the recognition of the original cause, unless the case is seen in the acute stages, may be a matter of great difficulty. A retrospective diagnosis in such a case may be possible if a careful history be obtained of the initial symptoms, particularly as to the presence of pain. Disseminated encephalomyelitis, both in its acute phase and in its sequelæ, may closely resemble disseminated sclerosis. It is suggested, but without any proof, that a different virus is responsible for these two diseases, and that in acute disseminated encephalomyelitis immunity is usually conferred upon the person by the first attack, whereby relapses are prevented.

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THE INCIDENCE AND SOURCE OF BRUCELLA ABORTUS INFECTION IN MAN.

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Kristensen, commenting in 1928 on the high incidence of *Brucella abortus* infection among the population of Denmark, stated: "There is no reason to believe that this infection is more widespread here in Denmark than in other countries where cattle-breeding is carried on to the same extent; it must be supposed that if systematic enquiries of a similar nature were set on foot in Germany and England the same conditions would be found." So far, however, there has been no evidence to suggest that human infection with *Br. abortus* is so widespread in Britain as it is in Denmark, where 500 cases were discovered in 13 months by the agglutination test (Kristensen and Holm) or in the United States of America where, according to a recent report, there were 206 cases in 1927, 635 in 1928, and 402 from January to May, 1929 (Hardy). Since 1925, less than 30 cases of "abortus fever" in man have been reported in Britain, and yet contagious abortion of cattle is probably as common here as in the two countries mentioned. The suggestion that the low incidence of the infection is more apparent than real, and is to be ascribed to a lack of clinical consciousness of the disease, gains some support from the discovery of five cases of "abortus fever" in Glasgow during the past nine months (see Cruickshank and Cruickshank) and from the fact that Harrison and Wilson (1928) in Manchester examined 998 sera submitted for Wassermann reaction and found that 50 (5 per cent.) agglutinated *Br. abortus* in dilutions varying from 1 : 10 to 1 : 80.

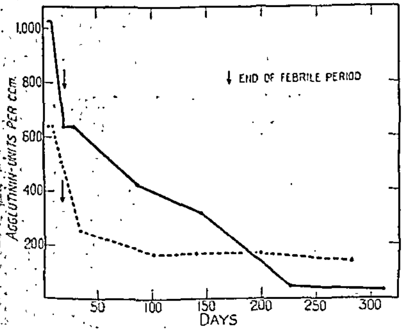
To find out if there existed any undiscovered incidence of *Br. abortus* infection in and around Glasgow, two samples of the population were chosen: (*a*) the in-patients of a general hospital; and (*b*) a community in close association with aborting cows. The criterion of infection, past or present, was the presence in the blood-serum of agglutinins to *Br. abortus*. A high concentration of agglutinins in the presence of undulant fever may be regarded as diagnostic of active "abortus fever"; the identification of past infection depends on the persistence of agglutinins in the blood after an attack and requires the establishment of a diagnostic titre.

Br. abortus infection of bovine origin may be derived either directly from the cow by contact with infected discharges or indirectly by drinking infected milk. It was hoped, by examination of the two samples of the population, to discover which was the more common source of infection. Further, the milks from all the cows in an infected herd were bacteriologically tested by guinea-pig inoculation, so that information about the excretion of *Br. abortus* in the milk might be obtained. As a large number of the cows, both infected and healthy, had recently received an injection of living but attenuated *Br. abortus* vaccine, the effect on these animals of abortus inoculation could be studied.

Agglutination after Abortus Fever.

It is generally agreed that during an attack of undulant fever agglutinins to the infecting organism may be present in great concentration, no other organisms giving such a high agglutination titre as is given at times by brucella (see Dalrymple-Champneys); for example, in three cases examined by one of us the titres were 1 : 2500, 1 : 1600, and 1 : 3200. If these agglutinins persisted in the blood for a prolonged period after infection, and were evoked by infection only, retrospective diagnosis of undulant fever could readily be made and an estimate of the incidence of past infection in a group of individuals could be obtained. There are, however, few records about the persistence of agglutinins in the blood after an attack of abortus fever; Kristensen and Holm have recently given data which indicate that the specific agglutinins disappear within a few months to a year after recovery from the disease.

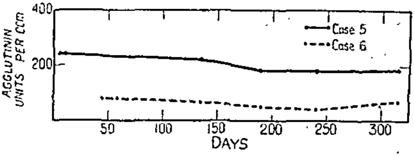
FIG. 1.



Agglutinin content of the serum in two cases (J.M. and M.K.) of "abortus fever." Continuous line = J.M., dotted line = M.K.

In the present investigation, the sera of two cases of abortus fever (J.M. and M.K.) have been examined for agglutinin content over a period of ten months, while similar records have been kept of two farm-workers whose sera agglutinated *Br. abortus* in dilutions of 1 : 600 and 1 : 150 respectively (see Figs. 1 and 2). In the cases of abortus fever, of which the highest titres were 1 : 2560 and 1 : 1600, there was at first a rapid and then a more gradual decline in the agglutinin content of the serum, but even ten months after recovery the titre was still sufficiently high (1 : 80 and 1 : 320 respectively) to allow a tentative diagnosis of previous abortus infection. The two farm-workers had, throughout the period of examination, a relatively high agglutinin-content without a definite history of past infection, so that in their case the presence and persistence of agglutinins may perhaps be attributed to their association with aborting cows.

FIG. 2.



Agglutinin content of serum of two byre workers. (Continuous line = Case 5, dotted line = Case 6.)

The *diagnostic titre*, which is the lowest positive dilution of serum to be regarded as indicative of infection, has been variously stated—from 1 : 10 to 1 : 200—by different workers. Our examination of the blood-sera of a sample (1522) of a general hospital population resulted in such a high proportion of wholly negative agglutination-reactions, and less than 2 per cent. of positive cases in a dilution of 1 : 20, that a titre of 20 standard agglutination units (S.A.U.) per c.cm.* was proposed as presumptive evidence of previous infection. This arbitrary standard was chosen in preference to the lower diagnostic titre of 10 S.A.U. per c.cm.—originally recommended by G. Dreyer for enteric infections and sponsored by the Medical Research Council for the diagnosis of undulant fever—largely because it was felt that the latter standard might include persons with a low concentration of agglutinins in their blood due to the ingestion of infected milk (King and Caldwell) or from other causes. We have found, for example, that the concentration of agglutinins in the blood of persons in close association with epizoötic abortion may be considerably higher than our diagnostic titre without necessarily indicating a past infection or the presence of an acute febrile illness. This finding has been confirmed by a recent report on the examination of 49 veterinary surgeons in America: the sera of more than half of these men, only three of whom gave histories of infection, agglutinated *Br. abortus* in dilutions varying from 1 : 50 to 1 : 500 (Huddleson and Johnson). While therefore 20 S.A.U. per c.cm. or a dilution of 1 : 50 may ordinarily be accepted as the diagnostic titre, a qualification may be made that consideration must always be given to the occupation and environment of the individual.

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* Using the Oxford standard agglutinable cultures with a factor of 2·0–2·5, this corresponds to a dilution of the serum of 1 : 40–1 : 50.

Investigation of a Hospital Population.

To find the incidence of infection, all sera submitted for Wassermann reaction from the wards and dispensaries of the Glasgow Royal Infirmary during the six months November, 1929, to April, 1930, were tested for the presence of agglutinins to *Br. abortus*. The blood-sera of practically all patients admitted to the medical wards of the hospital are tested routinely for Wassermann reaction and only in the dispensaries and on the surgical side are cases selectively chosen; it followed that most of the sera examined came from a sample of the population suffering from a wide variety of medical ailments, including obscure pyrexias. Only 8·8 per cent. of these sera gave a positive Wassermann reaction.

Method.—All sera had been inactivated on the previous day by heating at 56° C. for half an hour. Dilutions of the sera of 1 : 10, 1 : 20, and 1 : 40, each of 0·5 c.cm. volume, were made in agglutination tubes, and to each tube there was added an equal amount of a suspension of *Br. abortus* prepared by emulsifying a 48-hours' serum-agar culture in normal saline, diluting the emulsion to an opacity equivalent to 1000 million organisms per c.cm., and heating at 60° C. for an hour. The final dilutions were therefore 1 : 20, 1 : 40, and 1 : 80; latterly only dilutions of 1 : 20 and 1 : 40 were used. The tubes were incubated in the water-bath at 56° C. for four and a half hours, and then allowed to stand at room temperature overnight before the readings were taken. If agglutination occurred with a serum in a dilution of 1 : 40 or over, the test was repeated on the following day with the Oxford standard agglutinable cultures, using Dreyer's method for the Widal reaction, and the results recorded in terms both of serum dilution and of standard agglutinin units. Sera which did not agglutinate the organism in dilutions beyond 1 : 20 were not re-tested.

It has been stated that non-specific agglutinins for *Br. melitensis* may be present in the blood of normal persons, but that these are destroyed by "inactivating" the serum (Nègre and Reynaud). Zone-phenomenon in the dilutions 1 : 25 and 1 : 50 was a feature of the agglutination-reactions in the present study when the sera from the patients with abortus fever were tested against the standard agglutinable cultures of *Br. abortus*; it did not occur with emulsions of the stock culture (N.C.T.C.) and is not likely to be a complication unless the titre is high.

Results.—No acute case of abortus fever was discovered during this routine examination, the cases quoted having been otherwise detected. Of 1522 sera tested, 25, or 1·6 per cent., gave a positive agglutination reaction in a dilution of 1 : 20, and 11 more reacted positively in dilutions of 1 : 40–1 : 80. When these 11 sera were further tested with the standard agglutinable culture, 7 (or 0·46 per cent. of the total) were positive in dilutions of 1 : 50 (= 20 S.A.U.), 1 : 125 (= 50 S.A.U.), and in one case 1 : 250 (=100 S.A.U.). Inquiry was made into the previous health of these seven patients and in several instances suggestive histories of recent ill-defined illness were given.

CASE 1, a town-bred medical student aged 30, had acute appendicitis 11 months ago; he was admitted with diarrhœa and bleeding from the bowel of two weeks' duration. He had night sweats, but they were practically apyrexial. Nothing was found on physical examination, and there was no history of previous febrile illness. He had had two injections of T.A.B. vaccine in 1916.

His agglutination reaction with *Br. abortus* was positive 1 : 125 (50 S.A.U.); two days later positive 1 : 250 (100 S.A.U.), but also positive 1 : 250 (62·5 S.A.U.) for *B. paratyphosus* B and 1 : 125 (15 S.A.U.) for *B. typhosus*. Examination of blood, fæces, and urine was negative. Re-tested ten days later, when the patient was well, the serum agglutinated *Br. abortus* in a dilution of 1 : 125 and *B. paratyphosus* B 1 : 250. A month after dismissal, the patient's serum was positive 1 : 50 with *Br. abortus* and 1 : 250 with *B. paratyphosus* B. That the agglutinins to *Br. abortus* were coagglutinins to *B. paratyphosus* B seems unlikely, as in eight other cases with positive Widal reactions to *B. paratyphosus* B there was no agglutination of *Br. abortus*.

CASE 2, a female town-dweller aged 51, was admitted with afebrile peripheral neuritis. This patient had been confined to bed for one month a year earlier with fever and some sweating, diagnosed as a chill. Her agglutination reaction (*Br. abortus*) was positive 1 : 125 (50 S.A.U.).

CASE 3, a female aged 26, was an epileptic of low intelligence. She was afebrile and had lived until recently on a farm in Ireland. There was no history of obscure [illegible] Her agglutination reaction (*Br. abortus*) was positive 1 : 125 (50 S.A.U.). This may have been due to the a[illegible] of the patient with cattle.

CASE 4, a female aged 20, a town-dweller, was [illegible] with bronchitis and a temperature of 99°–101° F. for a week. She had had appendicitis two years previously, followed immediately, while still in hospital, by "pleurisy" and irregular fever for five weeks. Her agglutination re[illegible] (*Br. abortus*) was positive 1 : 125 (65 S.A.U.).

Two of the remaining three cases gave histories of "influenza" 12 and 15 months previously, in one case followed by a generalised arthritis; their blood-sera each agglutinated *Br. abortus* in a dilution of 1 : 125 (65 S.A.U.). The last case, a diabetic, whose agglutination reaction with *Br. abortus* was positive 1 : 50, gave no history of previous obscure fever.

It must be admitted that the past histories of these patients, while suggestive in certain instances, do not afford absolute proof of infection, and the conclusions that even this small percentage of the community have had abortus fever must rest on the interpretation of the agglutination reaction.

In addition to these 1522 sera, there were 50 sera sent for Widal reaction from cases of continued fever; eight of these were subsequently shown to be paratyphoid B infections and one typhoid fever (positive Widal reaction *plus* isolation of the specific organism from the fæces). In all cases the sera reacted negatively with *Br. abortus*. Sera from eight cases of long-continued pyrexia (bacterial endocarditis, tuberculous infection, pyrexia of unknown origin) did not agglutinate *Br. abortus* in a dilution of 1 : 20. Meiser found, among 167 sera agglutinating one or other member of the enteric group, five which agglutinated *Br. abortus* in dilutions of 1 : 50–1 : 100. There was, however, no evidence that the phenomenon was due to coagglutinins, and the author concluded that it indicated a previous attack of undulant fever.

Investigation at an Infected Farm.

Several outbreaks of contagious abortion had occurred in the dairy-herd on the home-farm of the institution to which one of us is attached, an opportunity was afforded for carrying out some investigation on *Br. abortus* in persons consuming the milk-su[illegible] from the infected source or working in actual co[illegible] with the infected cattle. The investigation took the form of (*a*) agglutination tests with the sera of [illegible] picked sample of the community, and (*b*) inquiry in[illegible] the previous health and histories of individuals [illegible] whom a positive agglutination reaction was obtained.

The blood-sera of 112 cases were examined. Patients working in the byre and those whose duties brought them into actual contact with the animals were examined first, as they were deemed the likeliest to show a positive result. Subsequently patients engaged in general work on the farm were examined, and also other patients in different parts of the institution in whose diet milk was one of the main items. Milkers are unfortunately not included in any of the above groups. As they were private individuals, permission to take blood samples could not be obtained.

The *method* adopted for the agglutination reaction was similar to that described except that the Oxford standard agglutinable cultures were used throughout and a larger series of dilutions, viz., 1 : 25, 1 : 50, 1 : 100, 1 : 125, 1 : 150, 1 : 200, and 1 : 250 were used. In one case where complete agglutination occurred at

1 : 250 further dilution was made up to 1 : 1000. In cases giving a positive result with *Br. abortus* the agglutination reaction was repeated at a later date to verify the result and establish an accurate titre.

Results.—Of 112 cases—71 males and 41 females—ten showed agglutination of *Br. abortus* in a dilution of the serum of 1 : 25 or higher; they were all males. To show the close serological relationship between *Br. abortus* and *Br. melitensis*, the blood-sera of all positive cases were tested against a standard agglutinable culture of the latter organism (see Table).

TABLE *giving the Agglutinin-content for* Br. abortus *and* Br. melitensis *of the Sera of Individuals in Association with Aborting Cows.*

Case	Age.	*Br. abortus.*		*Br. melitensis.*		Occupation.
		S.A.U.*	Dilution.	S.A.U.	Dilution.	
1	57	20	1 : 50	20	1 : 50	Indoor house worker.
2	58	13	1 : 25	10	1 : 25	,,
3	28	20	1 : 50	20	1 : 50	Byre worker.
4	51	20	1 : 50	20	1 : 50	,,
5	27	240	1 : 600	180	1 : 450	,,
6	28	70	1 : 150	40	1 : 100	Former byre worker.
7	37	20	1 : 50	10	1 : 25	Dairy worker.
8	30	26	1 : 50	20	1 : 50	Squad worker.
9	46	26	1 : 50	20	1 : 50	,,
10	16	20	1 : 50	20	1 : 50	Sanatorium patient.

* S.A.U. = Standard agglutinin unit.

All the positive cases save one occurred among the farm workers, byre workers being chiefly affected. No agglutination reactions were obtained from the 41 female cases, although their milk-supply was the same as that of the byre workers. All the sera which agglutinated *Br. abortus* likewise agglutinated *Br. melitensis*, but not always to the same titre.

Inquiry into the previous health and histories of those in whom a positive reaction was obtained is not very enlightening, but it is suggestive that in certain cases histories of indefinite illness during the last three years were obtained. None of these cases has suffered recently from pyrexia—not even those whose sera agglutinated *Br. abortus* to a high titre—viz., 1 : 600 and 1 : 150. The latter two individuals had *their temperatures recorded twice* daily for a fortnight after the discovery of the positive Widal reaction but no variations were observed.

CASE 5, aged 27, was admitted on May 19th, 1924 (*Br. abortus* 1 : 600, *Br. melitensis* 1 : 450). He has always enjoyed fair health, but was laid up on Oct. 3rd, 1926, when he was found to be losing weight. He had no pains, cough, or sputum, and his appetite was good. His temperature was 98·4° F., his pulse-rate 70, and his respiration-rate 18. At present he is quite fit and out working daily.

CASE 6, aged 28, was admitted on March 13th, 1921. (*Br. abortus* 1 : 150, *Br. melitensis* 1 : 100.) He has been confined to bed on several occasions. On June 17th, 1925, he complained of pains in the legs and headache and his temperature was 100·2° F., his pulse-rate 98, and his respiration-rate 22. His evening temperature was always high—100·4°–101·2° F.—and his illness lasted three weeks. On Feb. 16th, 1926, he was laid up for a few days with abdominal pain. His general health is good at present and he is out working daily.

Three of the other cases gave a history of illness in April, 1926, but *no record is available of abortion being prevalent* among the cattle about that time.

It seems, therefore, that direct contact with infected cattle is more likely to cause agglutinin-formation, and presumably infection, among the human population than is the drinking of unsterilised infected cow's milk.

Excretion of Br. Abortus in Milk.

Mainly as a result of a rather severe epidemic of contagious abortion in a herd of dairy cows among which the infection had been occurring sporadically for several years, the management of the farm decided to institute a system of vaccination with living abortus cultures in an attempt to stamp out the infection. An opportunity was afforded us to examine the individual milks of the herd, a large number of which had received some time previously a single subcutaneous injection of living abortus vaccine. Information could therefore be obtained regarding: (*a*) infection of the udder in those cows which had aborted, with the consequent excretion of *Br. abortus* in the milk; (*b*) the continuity or intermittency of such excretion; and (*c*) the possibility of the excretion of *Br. abortus* in the milk after vaccination with live cultures.

It is believed that the udder is readily infected from the uterus and becomes the habitat of *Br. abortus* during the non-pregnant state (Schroeder and Cotton). Guinea-pig inoculation has shown that *Br. abortus* is present in a fair proportion of market milks, which are probably the source of infection in individuals not closely associated with cattle. Wilson and Nutt in 1926 concluded that 5·7 per cent. of single milks and 8·8 per cent. of mixed milks were infected, while pooled market milks in America have shown a higher incidence without, however, *disclosing what percentage of infected cows in* an individual herd excrete the organism in the milk. In the present investigation samples of milk were obtained from each member of a herd of 37 cows.

Method of Examination.—The samples of milk were received in sterile bottles on the day of milking. At first only the sediment of milk was injected, and for this purpose 100–150 c.cm. of each specimen was centrifuged at high speed and the resulting deposit, suspended in 2 c.cm. of normal saline, was injected intraperitoneally into adult guinea-pigs weighing 16–20 oz. In a later series of milks the supernatant cream obtained after spinning was used as *the inoculum, and in another series both cream and* sediment were injected, the object being to find whether the organism is more likely to be found in the cream, as has been asserted (Carpenter and Baker), or in the sediment. Each batch of guinea-pigs was killed after intervals of two to three months from the time of inoculation. Except for a first lot of ten guinea-pigs which were autopsied at once, the carcasses were kept at 0° C. until their blood-serum had been examined for the presence of agglutinins to *Br. abortus*. The animals were then autopsied, special care being taken in the examination of those whose sera had given a positive agglutination reaction.

Results.—In all, 51 *samples of milk from* 37 cows were tested; both the cream and sediment from five of these specimens were injected, making a total of 56 inoculated guinea-pigs. Five animals died within two weeks of inoculation; in three there was a streptococcal peritonitis and in two no cause for death was discovered. The rest remained well and did not lose weight. Agglutinins to *Br. abortus* were present in the serum of 9 out of 51 guinea-pigs killed 2–3 *months after inoculation*, the titres varying from 1 : 320 to 1 : 2560. When autopsied, three of these animals did not show any macroscopic morbid changes, and in the absence of the agglutination test would have been passed as not infected. In two of the other six there was enlargement of the superficial lumbar (sublumbar) glands but no gross changes in the spleen or elsewhere. The remaining four animals presented the classical picture of *Br. abortus* infection in the guinea-pig: enlargement of the lumbar glands and of the spleen, and throughout the substance of the spleen many greyish-white tubercles, not unlike those of a tuberculous infection but more "pearly" in appearance and, like the glands, not showing any tendency to caseation. Histologically these nodules appeared as collections of endothelial or epithelioid cells without giant-cells. Similar granulomata have been described in the liver, lungs, and testicles of infected guinea-pigs, but in only one of the present series were greyish nodules observed in the liver. *Br. abortus* was cultured from the spleens of two infected guinea-pigs, growth occurring on serum-agar slopes plugged with rubber stoppers after 3–4 days' incubation at 37° C.

These nine infected guinea-pigs represented the milks of four cows, or 10·8 per cent. of the number examined. From one cow there were three positive samples; both the cream and sediment of one of these samples were injected and both produced infection; from another cow there were two positive samples and again both the cream and the sediment of one of the specimens produced infection. Of the remaining two positive milks from two cows, in one the cream and in the other the sediment was used as the inoculum. It is evident, therefore, that the infecting organism may be present in both the cream and the sediment of the milk.

In order to find out if *Br. abortus* was being continuously excreted in the milk of infected cows, repeat samples were obtained from four cows which had aborted early in 1929 and again late in the same year. From one cow the organism was recovered by guinea-pig inoculation in the first, second, and fourth of four samples examined during a period of three months; from another in the first and third of three samples, a fourth specimen being discounted as the guinea-pig died six days after inoculation. From a third cow only the first of three specimens was positive, while all three specimens from the fourth cow were negative. The remaining positive milk was a second specimen from a cow which had aborted a year previously and was obtained when the cow was "going dry," being in calf. There is therefore some evidence of an intermittency in the excretion of *Br. abortus* in the milk, so that two or three specimens may be required to discover whether or not a cow is a milk carrier of the organism. On the other hand, an animal which has aborted may not excrete the organism in the milk.

Protection by Vaccines.

McFadyean and Stockman in 1913 first demonstrated the efficacy of a vaccine of living *Br. abortus* as compared with killed cultures to protect healthy cows against abortion. Recent work in America (Buck and Creech) has indicated that the usefulness of the living vaccine is limited to its employment as a prophylactic measure against epizoötic abortion, and that it has little or no value in the treatment of established infection. There is even a danger, it is said, that cattle inoculated with living vaccine may become chronic milk carriers of the organism (Carpenter). Consequently vaccination has been largely abandoned in America and a system of eradication of the positive reactors adopted.

It is difficult to assess the value of living vaccines in lessening the incidence of abortion in an infected herd, since cows which have aborted once do not readily abort a second time, although they may still be carriers of *Br. abortus*. However, it is important to inquire whether vaccination is actually harmful, either by predisposing to subsequent abortion or by producing infection and a milk carrier condition in previously healthy cows. The following Table illustrates the results obtained in the herd under consideration.

Cows inoculated, 30.

Previous abortion, 18 (4 positive milks).
Subsequent abortion, 4
(3 of the 4 positive milks belong to this group).

No previous abortion, 12 (no positive milks).
Subsequent abortion, 0.

It is seen that in 12 healthy cows the inoculation of living *Br. abortus* vaccine has not resulted either in infection as indicated by abortion (all these cows have since had full-time calves) or in excretion of the organism in the milk. Among 18 cows with history of previous abortion there were four positive milks (22 per cent.), which compares favourably with the findings of Winkler, who had 13 positive milks (40 per cent.) from 32 uninoculated cows which had recently aborted. The occurrence in this group of four subsequent abortions is in keeping with the general experience that about 20 per cent. of cows abort a second time. There is therefore no evidence from the present work that the use of living vaccines of *Br. abortus* is harmful either to infected or healthy cows.

Conclusions.

(1) The incidence of *Br. abortus* infection as judged by the agglutination test was so low (less than 0·5 per cent.) in a sample of a general hospital population that the probability of its being a common infection in this country seems remote. (2) Association with infected cattle—e.g., by dairymen, farmers, and veterinary surgeons—may result in the formation in the blood of agglutinins to *Br. abortus* without necessarily producing infection. On the other hand, drinking infected milk does not seem to result in agglutinin-formation to any extent. (3) Only a proportion of infected cows (22 per cent. in this series) excrete *Br. abortus* in the milk. The excretion may be intermittent and the organism is present both in the cream and in the milk sediment. (4) Inoculation of a dairy herd with living *Br. abortus* vaccine, if not of curative value to infected cows, is not harmful to healthy animals and in the latter is probably a useful prophylactic measure. (5) Guinea-pigs infected with *Br. abortus* by milk inoculation may not show any gross pathological changes in the tissues, and the diagnosis of abortus infection in the guinea-pig rests primarily on the agglutination test.

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MAXIMAL RETICULOCYTE RESPONSES FROM INTRAVENOUS INJECTION OF A LIVER EXTRACT.

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IN the early stages of the chemical fractionation of liver, begun in an effort to isolate the active principle effective in pernicious anæmia, Cohn, Minot, and their associates[1] produced an active extract, the so-called "fraction G" which could be readily prepared and was found to be eminently satisfactory in the treatment of pernicious anæmia. Later Cohn,[2] West,[3] and their respective associates produced numerous experimental fractions which were given by mouth; but it was not until Cohn[4] was able to prepare fractions which gave no specific protein reactions and which had no reducing effect on the blood pressure of animals that it was considered possible to administer the active principle intravenously to patients. After this stage of the work had been reached Cohn,[5] West,[6] and their respective associates prepared many potent fractions which were injected intravenously in patients.

The methods of preparing fractions then regarded as suitable for intravenous use were technically difficult and sufficiently laborious to render it impractical to prepare more than the small amounts of experimental fractions utilised in the search for the active principle. With an entirely different objective—namely, to discover the least number of steps necessary to produce from liver a potent fraction that could be injected intravenously with safety—we have adapted to our practical problem the methods of preparing effective liver fractions contributed by these investigators. The original fraction G of Cohn, Minot, and their associates[1] was precipitated in 95 per cent. alcohol from the concentrated water-soluble extractives of minced liver, from which extractives the proteins had previously been removed by iso-electric precipitation and heat. Although the precipitate so formed was readily soluble in water, and had been freed of proteins and, by alcohol, of the larger polypeptide molecules possibly capable of producing allergic phenomena if intravenously administered, it was shown to contain a blood-pressure lowering substance.[2] For this reason, only subfractions largely or entirely free of the depressor substance were given intravenously to patients. Nevertheless, because of the relative ease of preparation of this fraction G and because the objection to its intravenous use seemed to be based, in theory at least, solely on its blood-pressure lowering properties, it appeared to us a suitable starting-point for our studies.

Depressor Action of Extracts.

In the course of observations on rabbits and cats carried out with several derivatives of this fraction, the experience of Cohn and his associates[2 5] was confirmed in that it was found to be impossible except by difficult and expensive procedures to eliminate or greatly reduce the blood pressure lowering substance. On the other hand, it was at once noted that the persistence of this depressor effect in cats was always short (1 to 2 minutes) and numerous observations showed that the magnitude of the effect could be easily controlled by varying the rate of injection of the material. For intravenous injection the derivatives of fraction G which were prepared by us appeared therefore to have no advantage over fraction G itself. Further observations then showed that aside from a transient effect on blood pressure aqueous solutions of the original fraction G had no evident deleterious action on rabbits when injected daily for several days in amounts 0·2 g. per kg. of body-weight. On this basis, and because of the previous successful experience of Cohn, McMeekin, and Minot[4 5] with intravenous injections of related fractions, it was considered safe to try the effect on a pernicious anæmia patient of a single intravenous injection of an extract containing a little over 0·1 g. per kg. of body-weight of fraction G dissolved, after washing with ether, in physiological salt solution. This solution was so prepared that 20 c.cm. contained the amount of material derived from 100 g. of liver—i.e., about 4·5 g. of a commerical preparation of fraction G. After solution a small insoluble residue was removed by careful filtration or centrifuging, and the resulting clear dark reddish-brown liquid sterilised by boiling for five minutes.

The effect of the blood pressure of this patient and of others since injected intravenously with this material was found to be similar to that already observed in cats. Both systolic and diastolic pressures were decidedly lowered if the extract was injected faster than at a rate of 4 c.cm. per minute. The effect was more marked when the patients were more anæmic or had a lower original blood pressure; but in all instances the blood pressure returned to its original level within one or two minutes after the termination of the injection. The immediate effects on blood pressure were evidently of no importance if the rate of the injection was governed by following the blood pressure or even after a little experience by observing the colour of the patient's face and the character of the pulse.

All the patients stated that their faces felt hot during the injection; and they looked flushed. One patient who gave a history of bronchial asthma had an attack of severe dyspnœa with some increase of the râles in the lungs at the termination of the injection. This effect suggests a parallel to the observations of similar symptoms with the intravenous injection of histamine which Weiss, Robb, and Blumgart[7] have reported as occurring in cases of pulmonary emphysema or bronchial spasm. The attack was promptly abated by a subcutaneous injection of 0·5 c.cm. of adrenalin 1/1000. It recurred at a second injection of the liver extract and was again promptly relieved by adrenalin, and was apparently prevented at a third injection by adrenalin administered just before the injection began. In one patient a moderately severe chill occurred about half an hour after the injection was completed, and later the temperature rose to 103° F. There were no significant febrile reactions in the other patients. It is a common experience that the intravenous injection of many substances, even salt solution, into certain pernicious anæmia patients, especially those with low red blood-cell counts, may produce a rigor and febrile reaction. Skin tests and conjunctival instillation of the extract performed in one patient ten days after the first gross changes in the spleen or elsewhere. The remaining four animals presented the classical picture of *Br. abortus* infection in the guinea-pig: enlargement of the lumbar glands and of the spleen, and throughout the substance of the spleen many greyish-white tubercles, not unlike those of a tuberculous infection but more "pearly" in appearance and, like the glands, not showing any tendency to caseation. Histologically these nodules appeared as collections of endothelial or epithelioid cells without giant-cells. Similar granulomata have been described in the liver, lungs, and testicles of infected guinea-pigs, but in only one of the present series were greyish nodules observed in the liver. *Br. abortus* was cultured from the spleens of two infected guinea-pigs, growth occurring on serum-agar slopes plugged with rubber stoppers after 3–4 days' incubation at 37° C.

These nine infected guinea-pigs represented the milks of four cows, or 10·8 per cent. of the number examined. From one cow there were three positive samples; both the cream and sediment of one of these samples were injected and both produced infection; from another cow there were two positive samples and again both the cream and the sediment of one of the specimens produced infection. Of the remaining two positive milks from two cows, in one the cream and in the other the sediment was used as the inoculum. It is evident, therefore, that the infecting organism may be present in both the cream and the sediment of the milk.

In order to find out if *Br. abortus* was being continuously excreted in the milk of infected cows, repeat samples were obtained from four cows which had aborted early in 1929 and again late in the same year. From one cow the organism was recovered by guinea-pig inoculation in the first, second, and fourth of four samples examined during a period of three months; from another in the first and third of three samples, a fourth specimen being discounted as the guinea-pig died six days after inoculation. From a third cow only the first of three specimens was positive, while all three specimens from the fourth cow were negative. The remaining positive milk was a second specimen from a cow which had aborted a year previously and was obtained when the cow was "going dry," being in calf. There is therefore some evidence of an intermittency in the excretion of *Br. abortus* in the milk, so that two or three specimens may be required to discover whether or not a cow is a milk carrier of the organism. On the other hand, an animal which has aborted may not excrete the organism in the milk.

Protection by Vaccines.

McFadyean and Stockman in 1913 first demonstrated the efficacy of a vaccine of living *Br. abortus* as compared with killed cultures to protect healthy cows against abortion. Recent work in America (Buck and Creech) has indicated that the usefulness of the living vaccine is limited to its employment as a prophylactic measure against epizoötic abortion, and that it has little or no value in the treatment of established infection. There is even a danger, it is said, that cattle inoculated with living vaccine may become chronic milk carriers of the organism (Carpenter). Consequently vaccination has been largely abandoned in America and a system of eradication of the positive reactors adopted.

It is difficult to assess the value of living vaccines in lessening the incidence of abortion in an infected herd, since cows which have aborted once do not readily abort a second time, although they may still be carriers of *Br. abortus*. However, it is important to inquire whether vaccination is actually harmful, either by predisposing to subsequent abortion or by producing infection and a milk carrier condition in previously healthy cows. The following Table illustrates the results obtained in the herd under consideration.

Cows inoculated, 30.	
Previous abortion, 18 (4 positive milks).	No previous abortion, 12 (no positive milks).
Subsequent abortion, 4	Subsequent abortion, 0.
(3 of the 4 positive milks belong to this group).	

It is seen that in 12 healthy cows the inoculation of living *Br. abortus* vaccine has not resulted either in infection as indicated by abortion (all these cows have since had full-time calves) or in excretion of the organism in the milk. Among 18 cows with history of previous abortion there were four positive milks (22 per cent.), which compares favourably with the findings of Winkler, who had 13 positive milks (40 per cent.) from 32 uninoculated cows which had recently aborted. The occurrence in this group of four subsequent abortions is in keeping with the general experience that about 20 per cent. of cows abort a second time. There is therefore no evidence from the present work that the use of living vaccines of *Br. abortus* is harmful either to infected or healthy cows.

Conclusions.

(1) The incidence of *Br. abortus* infection as judged by the agglutination test was so low (less than 0·5 per cent.) in a sample of a general hospital population that the probability of its being a common infection in this country seems remote. (2) Association with infected cattle—e.g., by dairymen, farmers, and veterinary surgeons—may result in the formation in the blood of agglutinins to *Br. abortus* without necessarily producing infection. On the other hand, drinking infected milk does not seem to result in agglutinin-formation to any extent. (3) Only a proportion of infected cows (22 per cent. in this series) excrete *Br. abortus* in the milk. The excretion may be intermittent and the organism is present both in the cream and in the milk sediment. (4) Inoculation of a dairy herd with living *Br. abortus* vaccine, if not of curative value to infected cows, is not harmful to healthy animals and in the latter is probably a useful prophylactic measure. (5) Guinea-pigs infected with *Br. abortus* by milk inoculation may not show any gross pathological changes in the tissues, and the diagnosis of abortus infection in the guinea-pig rests primarily on the agglutination test.

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(20 g. dry weight) to about 0·10 g. in the form of the active substance of West and Howe.[13] The greatest concentration so far obtained must therefore be about 200-fold.

Ætiological Significance.

The problem of securing a satisfactory liver extract readily available for intravenous use was undertaken largely for the purpose of extending studies already made upon the ætiologic relationship of gastro-intestinal pathology to pernicious anæmia. A specific type of gastric defect in patients with pernicious anæmia has already been demonstrated by one of us,[8] and is regarded as the factor of primary importance in the development of the disease. The suggestion was made of the existence of a defect of absorption of hæmatopoietic factors contained in the food or possibly formed to a certain extent in the stomach of certain atypical cases of pernicious anæmia, especially those associated with chronic disturbances of the lower intestines and an apparently normal gastric function. In the treatment of one of the cases referred to above the amount of liver extract No. 343 N.N.R. derived from 3000 g. of liver when given by mouth during a period of ten days had relatively little effect on blood formation (see Figure). Given thus to the average case of pernicious anæmia, that amount of potent substance should have produced a reticulocyte response approximately equal to that subsequently obtained from a single intravenous administration of the extract derived from 100 g. of liver. The simplest, but not the only explanation of this insignificant result from oral administration, is that it was caused by a relative impermeability of the intestinal wall of this particular patient who, however, responded like the other patients to the active principle when given parenterally. To what extent such a condition is present in all cases of pernicious anæmia or even as a normal physiological condition in respect to the absorption of the active principle of liver is at present under investigation. Thus it is believed that the demonstration of the strikingly greater effectiveness of the active principle when administered intravenously than when given by mouth is possibly of significance in the ætiology of the disease.

Clinical Use of Intravenous Extracts.

Finally, it would appear that the extract described is of potential therapeutic significance. The response to the active principle of liver may be hastened by its intravenous administration[5] and so be of life-saving value to the very sick patient. In the so-called resistant cases, as exemplified by the patient just referred to, the method would seem to have valuable possibilities. In the treatment of lesions of the spinal cord this method of administering the active principle or related substances such as vitamin B[16] may be of use. However, it cannot be too strongly emphasised at this time that the therapeutic possibilities of the extract described in this preliminary report are still largely unknown and that the intravenous injection of any substance has potential dangers which cannot always be foreseen. Excellent sources of potent substance highly effective and easily administered by mouth are readily available even to the impecunious patient.[17] The immediate therapeutic need is not for new sources of the active principle, but for persistence in the use of sufficient quantities of those already available.

Summary.

1. A readily prepared extract of liver (fraction G) hitherto administered by mouth has been found suitable for intravenous injection and highly potent in pernicious anæmia.

2. Maximal reticulocyte responses were obtained from a single intravenous injection of the amount of extract derived from 100 g. of liver. One of the patients so treated had failed to respond satisfactorily to the previous oral administration of a similar extract derived from 3000 g. of liver given within a period of ten days.

3. The possible ætiologic and therapeutic significance of these observations is discussed.

It is a pleasure to acknowledge our indebtedness to the staff of the medical services of the Rhode Island Hospital, Providence—in particular to Dr. Alexander M. Burgess and Dr. Charles F. Gormly—for permission to study patients on their services. We are also indebted to Dr. Herman A. Lawson, Dr. Theodore Davies, and Dr. Nicholas Sarro of that hospital for their kind coöperation in making these observations. The technical assistance of Miss Margaret Evans and of Miss Charlotte Nichlan is gratefully acknowledged.

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METROPOLITAN CONVALESCENT INSTITUTION.—This institution, which has three homes for adults and one for children, and a total of 588 beds, last year received considerably fewer patients than formerly. At the annual meeting Mr. Stewart Oxley, the chairman, said that it was difficult to explain the reason of the diminution, the more especially since the institution is of great value to many hospitals who are able to send cases in need of continued surgical treatment, thereby more speedily releasing their beds. Last year there were 5563 admissions. There was a considerable fall in income, which is accounted for by legacies, upon which the charity is much dependent, having amounted only to £25.

QUEEN VICTORIA MEMORIAL HOSPITAL, NICE.—The Duke of Connaught, who was accompanied by Princess Louise, Duchess of Argyll, recently opened a new nurses' home at this hospital. The Duke, who is the Patron, stated in his speech that in spite of the extra accommodation every bed in the hospital was occupied; every nurse on the outside nursing staff was occupied; to date, there had been 50 more admissions than last year; the four isolation annexes had been used simultaneously for the treatment of four different contagious diseases; and since the beginning of that season there had been 80 major operations. The sum of £15,000 that was obtained two years ago has been spent upon essentials to bring the hospital up to date, but a new theatre and X ray room are urgently needed. The new buildings have been provided by an anonymous American benefactor.

POST-OPERATIVE VOMITING.

By Bessie E. Cook, M.B. Manch.,
HON. ANÆSTHETIST, DONCASTER ROYAL INFIRMARY.

It is a popular belief, and one shared to a large extent by the profession, that to be sick for several days is the correct thing for any patient after having a general anæsthetic. It is certainly an observation founded on common experience, and the view that blame should be laid at the door of the agent used is reflected in the term "post-anæsthetic" vomiting. Plenty of theories as to how it happens are offered, many of them well supported by evidence; the chief are: local causes affecting the stomach, swallowed or excreted anæsthetic, and general changes in the blood stream, acting on the centre, either an acidosis or an anoxæmia.[3 4 5]

For over a year the anæsthetics given at the Rotherham Hospital have been more varied than is the case at most provincial infirmaries, since approximately one-half the patients have been given gas and oxygen with or without a little ether, and the rest have had chloroform and ether mixture, or pure ether, with no oxygen except in emergency. It seemed a waste of interesting material not to examine the records and see what differences could be found, and whether any useful conclusions might be drawn, especially since it has been claimed on the other side of the Atlantic that after-sickness has been greatly reduced since the increase in the use of nitrous oxide for major operations.[1 2] Accordingly, a number of cases were taken seriatim from the operation book, classified under their respective anæsthetics and subdivided as will be described later, and then their after-histories were followed up in the ward records. The results obtained have been tabulated in each class according to whether the patient did not vomit at all or was sick on one, two, or more days, which seemed the simplest test of the amount of general systemic upset. For convenience, cases which were only sick once are included with the "first 12 hours" section. As the fact soon emerged that the percentage rate of sickness in men was less than that in women, it was necessary to work out the rates separately and then take the average of the male and female rates in each class, so as to avoid any error due to varying proportions between the number of each sex.

Various Classes of Operation.

The operations have been classified according to their sites and severity. Class 1 is that of abdominal sections, including gall-bladder cases, gastro-enterostomies, hysterectomies, appendicectomies, and salpingectomies.

TABLE I. (CLASS 1).

Cases vomiting.	ETHER.			NITROUS OXIDE.		
	M.	F.	Aver. per cent.	M.	F.	Aver. per cent.
Nil	34	23	27·05	40	32	38·84
During 12 hours ..	45	57	46·09	27	65	43·95
" 1 day ..	5	15	8·45	7	10	8·61
" 2 days ..	8	15	10·06	1	10	4·71
" 3 "	1	6	2·84	2	2	2·10
" 4 or more ..	0	4	1·53	0	4	1·62
Total	93	120	—	77	123	—

M. = male; F. = female.

Those cases which, having had ether, were sick for longer periods than three days comprise one patient whose operation was a salpingectomy and remov of the appendix, with drainage, and who went vomiting for seven days, dying on the twelfth da with fluid in the chest; one hysterectomy, appendix with drainage, and a double salpingectomy. The gas cases were two hysterectomies, one gastri carcinoma for which on laparotomy nothing could b done, and a pregnancy, so that two of them would probably have vomited without an operation at all.

Class 2, the herniæ, while not, as a rule, involving in men such drastic manipulation of abdominal organs and peritoneum, still have their own special area in which *trauma is likely to produce disturbance*, viz., the cord, and it will be seen that the vomiting rate remains high in this section, being, indee noticeably higher than that for laparotomies, whil the majority of herniæ in females in this series ventral and so in many cases practically abdominal.

TABLE II. (CLASS 2).

Cases vomiting.	ETHER.			NITROUS OXIDE.		
	M.	F.	Aver. per cent.	M.	F.	Aver. per cent
Nil	18	0	17·64	37	4	39·89
In first 12 hours ..	25	9	56·60	25	9	45·64
" 24 "	2	0	1·96	2	0	1·53
" 2 days ..	4	5	21·72	1	3	9·53
" 3 or more ..	2	0	1·96	0	1	2·94
Total	51	14	—	65	17	—

Class 3, the fractures and bone operations, involvi a separate set of afferent impulses and a less easil damaged group of structures, show a diminuti in the amount of sickness.

TABLE III. (CLASS 3).

Cases vomiting.	ETHER.			NITROUS OXIDE.		
	M.	F.	Aver. per cent.	M.	F.	Aver. per ce
Nil	18	5	56·96	21	3	63·8
12 hours	15	3	40·20	10	2	36·1
24 "	2	0	2·85	0	0	0
Total	35	8	—	31	5	—

Class 4, perineal operations, includes all the lo part of the genito-urinary tract, with cystoscopi circumcisions, curettages, and colporrhaphies, operations, and fistulæ-in-ano.

TABLE IV. (CLASS 4).

Cases vomiting.	ETHER.			NITROUS OXIDE.		
	M.	F.	Aver. per cent.	M.	F.	Aver. per ce
Nil	15	28	54·58	28	39	66·93
First 12 hours	7	29	38·74	8	27	30·95
" 24 "	2	3	6·66	0	1	0·74
" 2 days	0	0	0	1	0	1·35
Total	24	60	—	37	67	—

Here the single patient who vomited on the sec day did so once only (and only twice the first day He had had a cystoscopy. A month previous he ha an appendicectomy performed under chlorofor and ether, when he was sick six times in the 48 hours

The last class is a miscellaneous one comprising al the rest, from tonsillectomies in adults to radical amputations for scirrhus. The latter were include here as there were not sufficient of them to form a class by themselves.

Over the whole series—500 patients who had ether, and an equal number who were given gas and oxygen—the average on all classes totals 43¼ per cent. who were not sick at all among the former, and 56 per cent. among the latter. These results have been shown in the form of graphs; and we were at once impressed by the close resemblance between the curves of the two *anæsthetics, although there is in every case a* slight but definite advantage on the side of gas and oxygen (Fig. 1).

TABLE V. (CLASS 5).

Cases vomiting.	ETHER.			NITROUS OXIDE.		
	M.	F.	Aver. per cent.	M.	F.	Aver. per cent.
All	33	23	59·09	26	27	71·45
First 12 hours ..	12	22	35·66	3	20	25·83
„ 24 „	0	2	2·35	0	0	0
„ 2 days	2	1	3·16	1	1	2·70
Total	47	48	—	30	48	—

Analysis of Factors.

Considering the differences between them, their rate of elimination, their relative effects on hepatic function and metabolic activities and also on gastrointestinal movements (under gas-oxygen anæsthesia these are found to be stimulated) [3] and in this series the fact that oxygen was given as a routine to the one group and not at all to the others, as well as differences in premedication, it was necessary to seek another factor common to both. Had anæsthesia been the principal cause of the vomiting, there is no reason why one class of operation should be followed by more sickness than another, except the duration of it and, in answer to this, many of the hernia and appendix operations only *occupied 20 minutes or so.* There are two factors concerned in producing similar results: anæsthetics and operations. There is a good deal of difference between the former; the latter are the same in each class. In view of this similarity of result, it appears reasonable to give more blame to the operation and less to the drug, for the vomiting that occurs. But because there is a degree of difference in the results, evidently the anæsthetic is a factor, though by no means the only one. It is quite in accord with this view that local and spinal anæsthesia, preventing impulses from the field of operation from reaching the brain, are followed by so little sickness. It is partly a question of depth of anæsthesia, but since surgeons who ask for very deep anæsthesia are usually those whose technique would produce reflex signs in patients not quite so deep, probably both causes, *surgical trauma and excessive anæsthesia, may be in* action at one and the same time. Some support is given to the theory that the operation is an important factor by *an examination of the percentages obtained* by different surgeons. The ether abdominal group was composed of the cases of five different operators and, had the anæsthetic been the cause of the sickness, the *figures should be about the same for each* operator. The numbers of cases were not great, so the results are suggestive but in no way conclusive. The average of cases in this group who had no sickness is 29·8 per cent. Surgeons *A* and *B* were very close to this figure, the one with 29·4 per cent. and the other with 28·8 per cent. Surgeons *C* and *D* had lower rates, only 21·4 per cent. and 15·3 per cent. respectively, while surgeon *E* holds the record of 32·4 per cent. not sick.

*One might almost venture the statement that, given a patient in fairly good condition and not too tempera*mental, an anæsthetic, per se, does not cause vomiting unless given in excess. A serious operation plus an anæsthetic may, and often does, cause vomiting, and a serious operation plus an excessive anæsthetic can be almost guaranteed to produce any amount of vomiting, except only when the unfortunate patient is too ill to be capable of reacting in that way.

To show that the personality of the patient counts for something, an out-patient in my experience some years ago was given ether for 20 minutes, for the disimpaction of an obstinate Colles's fracture. Later in the day he went home, escorted by his son, and on his next attendance we were informed that the patient had enjoyed for his tea the same afternoon two pork chops, which had been prepared for the son; the latter, who had merely waited inside the hospital, had found he had quite lost any desire for the meal.

Stay in Hospital.—It is claimed in the States that the gas patients are able to leave hospital a number of days sooner than those who have had ether. At Rotherham, as at other hospitals, many factors are *taken into account,* such as the state of the waiting list, the possibilities of home nursing, and the amount of time that the patient's own doctor may be able to devote to him. But these factors applied equally to patients receiving either anæsthetic; no class distinction governed the selection, so that when it is found that the gas cases, in similar groups of operations, actually have gone home on the average a

FIG. I.

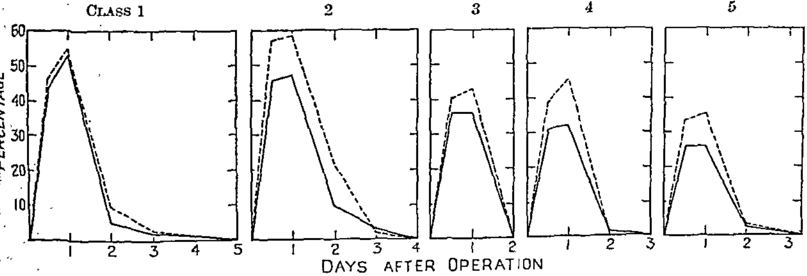


Chart showing the percentage incidence of vomiting after nitrous oxide (continuous line) and ether (dotted line) in five classes of case. 1 = abdominal; 2 = hernia; 3 = fractures; 4 = *perineal*; 5 = *miscellaneous.*

day or more sooner, it seems that their progress is really more rapid than those who have had ether. The figures for a group of clean appendix cases, uncomplicated, and for the hernia class, are as shown in Table VI.

TABLE VI.

—		Total cases.	Total days.	Average stay.
Appendix cases given	gas ..	62	794	11·2
	ether ..	80	1072	13·5
Hernia cases given	gas ..	72	974	13·5
	ether ..	47	726	15·5

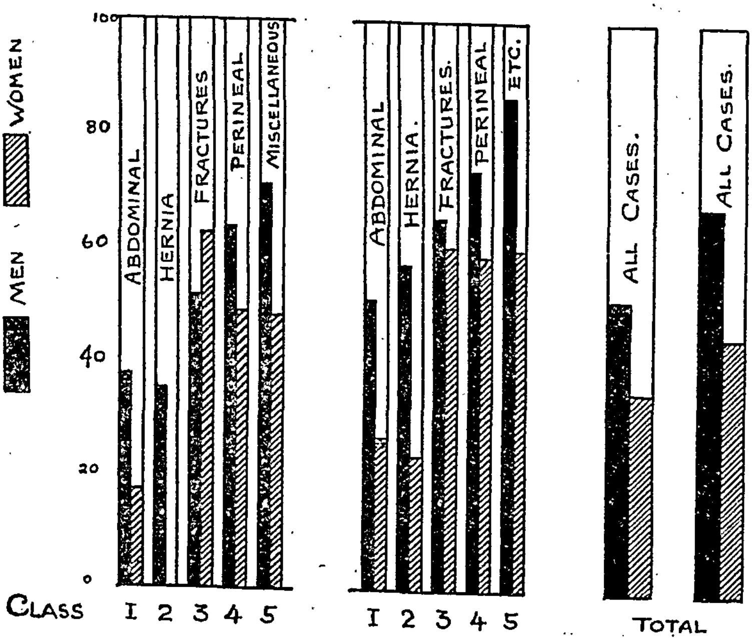
In addition to this, both the staff [4] and patients who have previously had ether confirm the great difference in the immediate well-being after operation, a difference which cannot be demonstrated in terms of statistics. The after-sickness is of a different quality. With ether there is only too often a heavy stuporose nausea for several days, even if there is no actual vomiting, and the taste of the drug lingers, since its complete elimination may take a week. With gas and oxygen, eliminated within a few seconds of the close of administration, the taste appears to be entirely absent, and it seems at least a possibility that some of the sickness occurring after gas could fairly be attributed to the fact that patients are sooner able to move voluntarily in bed. Alternatively, since, when it does happen, *it is frequently two or three times* during the first night—that is, some time after elimination of the agent—whereas, in ether it is during elimination, it suggests that it may come when the effect of the morphia is passing off, leaving the pain stimuli from the field of operation in possession. This is contrary to the experience of Macklin,[5] who finds sickness to occur immediately after the operation. As to earlier movement, many people find that keeping very still is of value when crossing the Channel.

Recovery.—Sir Francis Shipway writes, after referring to the dislike of losing one's conscious self, "Equally disliked is the return from profound anæsthesia with its alternating periods of nightmare and reality." [6] Although he was describing ether in contrast with avertin, his words apply equally well to the contrast between ether and gas cases, since after gas they are sufficiently wide awake to respond to questions by the time they leave the table. They have so little recollection of induction that at that moment the chief difficulty is to convince them that the dreaded operation is a thing of the past and, thanks to pr medication, by the next day they have little recollection of coming to the theatre. The ward sisters that they prefer their patients to have gas, as are so much sooner able to look after themselves. T preliminary drug used was, for the gas cases, ei 1 c.cm. of opoidine, or gr. ¼ of morphia with scop amine, so that by the time they left the wards th were somewhat drowsy, although quite ready t talk. Ether cases usually had atropine only.

Sex Differences.—Vomiting is only one-third t one-half as frequent in men as in women. While th nervous and endocrine systems in women are thing of most delicate balance, easily affected, and unconsciously, both by psychic and physic trauma, the stomachs of men are frequently in bett training to be insusceptible to foreign substance such as would produce nausea in digestive tracts le case-hardened, and so they require greater to start it. Of greater muscular development, especially if accustomed to generous rations nicotine and alcohol, such patients require larg amounts of anæsthetic; but in them, unless there definite gastric trouble, vomiting is relatively A reference to the previous tables shows the for each class, and Fig. 2 gives the proportion of ea sex which did not vomit. In each case there is rath less sickness under gas and oxygen. Only in Class the fractures, this relation apparently does not hold the reason may lie in the fact that the ladies Rotherham so seldom came under the anæsthetist care on account of those injuries that it was imp to collect sufficient cases to give reliable data. were only five females in one division and eight in th other.

Pulmonary Complications.—If women are liable to vomit, men are more liable to coug It seemed probable that the frequency of ch complications varied according to the time year, so that cases were put into two groups, one covering the period October to April, the May to Septer ber, a sort average d sion into and war weather. T cases we further divi according to and any ki of cough, an epidem coryza to broncho-p monia lastin a week or m has been cluded when th greater pro tion of cough amongst me was proved numerically Probably th is due to th fact that, up to now, men generally need good deal anæsthetic tha women. The figures to some

FIG. 2.



Ether. Gas and oxygen. Ether. N_2O.

Diagram showing percentage of cases in which there was no vomiting at all.

extent confirm the seasonal variation, but bring out even more strongly the fact that nitrous oxide is 50 per cent. less likely to be followed by chest complications than ether when given intensively. This is shown by the detail that, winter and summer, the ratio between the percentage of men and women having coughs is, after ether, approximately as 4 to 1, and, after gas, as 2 to 1, other conditions being equal. Both gas and ether cases are nursed in the same wards, but there is a tendency to ensure that "bad risk" cases, especially those with pre-operative lung and cardiac troubles, should get gas and oxygen owing to its lesser toxicity. It is evident that ether in high concentrations has a greater tendency to affect the lungs than has gas (Table VII.).

TABLE VII.

—	October–April. Total coughs and *per cent.*		May–September. Total coughs and *per cent.*
(1) GAS ..	Men	.. 10 in 42 (23·8)	5 in 25 (20)
	Women	.. 10 in 84 (11·9)	2 in 22 (9)
(2) ETHER	Men	.. 26 in 45 (57·7)	11 in 38 (28·9)
	Women	.. 10 in 69 (14·4)	3 in 40 (7·5)

Other Workers' Results.—Few statistics are available of the amount of vomiting which is usual. In Ross and Fairlie's text-book, J. F. R. Smith's figures are quoted as follows: In a gynæcological hospital, which would correspond to Class 4 in this series, only 20 per cent. of cases were sick at all, and about one-third of these "continued to vomit for periods varying from ten hours to three days." These rates are lower than those given by other writers. C. Potter, demonstrating great reduction in the amount of sickness from the use of glucose previous to operation, obtained, in a series of abdominal cases, 51 per cent. of cases not sick where glucose had been given, and writes in the same paper: "Trauma is an important factor (in causing vomiting). How many of us have been nauseated by smashing a finger? How much more, then, from rough handling of intestine?" and, comparing these results with a group of eight cases of operation on the extremities, which showed 100 per cent. not sick, she concludes: "The magnitude of the operation is a contributing factor to the vomiting as well as the anæsthetic." Most standard books appear to regard it as a more or less necessary evil in the majority of cases, and content themselves with giving various suggestions for its treatment. But many writers refer to the comparative infrequency of sickness with gas and oxygen, without mentioning numbers.

Death-rate.—The death-rate in the series numbered 20 in the gas, and 30 in the ether division. Neither division produced a death on the table, but whereas in the first 24 hours after operation two gas patients died, there were seven casualties in the ether division over the same period. It is not always possible to acquit the anæsthetic of all responsibility for deaths occurring after longer periods, apart from chest complications, since the results of profound circulatory and respiratory disturbances cannot be quickly repaired in a debilitated patient.

Conclusions.

If, as seems at least a possibility, trauma is of so great importance in even the minor discomforts after operation, this is a plea for gentler and still gentler technique in surgery. Gentler technique on the surgeon's part means that he need not complain even though gas and oxygen be used, and it is still of value when ether is given, since a less deep anæsthesia is needed. The use of gas means that the patients' respiratory and circulatory systems do not suffer so great an upset, and their organs, receiving less trauma from the velvet touch of the gas-accustomed surgeon, recover sooner from the necessary minimum of handling. Thus the patient gains in two ways and the surgeon gains in the long run, if he is prepared to pay the price of success. Nobody now claims for gas and oxygen that it gives greater access to the surgeon, but it can give him greater ease of mind as to its toxicity and chances of producing shock, and it affords—what, after all, should be the chief consideration—greater well-being to the patient in two trying and intensely important periods of time, the few minutes before consciousness is lost and the few days immediately following its return.

My thanks are due to Dr. E. J. Chambers, and others of the Rotherham Hospital, who have given me all assistance in the collection of these notes.

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CLINICAL AND LABORATORY NOTES

NECROSIS OF THE RIGHT KIDNEY

IN A CASE OF CEREBRO-SPINAL FEVER.

BY J. D. ALLAN GRAY, M.B., B.SC., M.R.C.P. EDIN., D.P.H.,
ASSISTANT CITY BACTERIOLOGIST, LIVERPOOL.

THE following case is one of almost complete necrosis of the right kidney associated with cerebro-spinal fever. It is interesting because there were no clinical features relating to the urinary system.

A baby, apparently healthy until 4 months old, developed vomiting and constipation. At 5 months he was admitted to the Royal Hospital for Sick Children, Edinburgh. At first, physical examination was completely negative, but gradually he showed a picture typical of cerebro-spinal fever, and died ten days after admission. There was no clinical abnormality attributable to the urinary system. For two days before death albuminuria was noted.

At autopsy all the typical appearances of a purulent meningitis with hypostatic congestion of the lungs were present.

The site of the right kidney was occupied by a firm nodular mass of tissue which, on section, showed a kidney-shaped area ¾ in. by ½ in. in size, surrounded by a zone of congestion. The left kidney presented no pathological feature to the naked eye and was not unduly large for the size of the body. The renal artery of the right side, although smaller than that of the left, was not occluded. Both ureters were identified and both opened into the bladder.

Microscopical examination.—The kidney-shaped area in the site of the right kidney consisted of kidney tissue which had necrosed and undergone hyaline degeneration; only very few glomeruli and tubules could be distinguished. A considerable amount of calcareous material was present. The tissue round the actual kidney substance consisted of suprarenal gland and adipose tissue. The left kidney was very congested and showed toxic changes.

The right kidney was of about the average size of a kidney in a fœtus of 5–9 months. Allowing for a certain shrinkage in size, it seems justifiable therefore, to assume that at some time in the later months of intra-uterine life or soon after birth this kidney necrosed. The most likely cause of the necrosis seems to be infarction. No occlusion of the renal artery, however, was found. The albuminuria two days before death can be fully accounted for by the toxæmia, so that we are left with a negative urinary history. The left kidney must have been able to compensate for the cessation of function in the right organ.

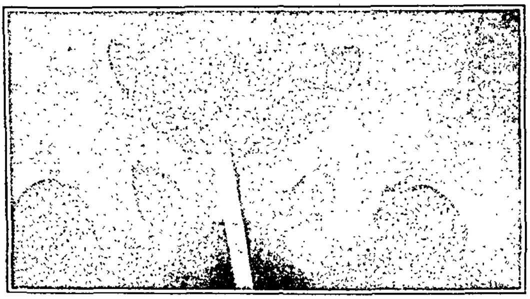
I have to thank Dr. Charles McNeil and Dr. Agnes R. Macgregor for permission to publish the case.

CATHETERISATION OF THE EJACULATORY DUCTS AND A SEMINAL VESICULOGRAM.

BY FRANK KIDD, M.CHIR. CAMB., F.R.C.S. ENG.,
CONSULTING SURGEON TO ST. PAUL'S HOSPITAL, LONDON.

A MAN, aged 26, had suffered during the last two years from two attacks of gonococcal urethritis. During the first attack he had left epididymitis, during the second attack right epididymitis. The disease was finally cured by means of prostatic and vesicular massage, irrigations, and the passage of large bougies.

The patient wished to know if he was fertile. He was examined with a McCarthy pan-endoscope and the attachments devised by McCarthy for catheterising the ejaculatory ducts. A perfect view was obtained of the verumontanum. The left ejaculatory duct orifice was closed and would not admit a catheter, the right ejaculatory duct orifice was patent and admitted a catheter readily. Sodium iodide was injected up the catheter and a radiogram was taken (see Figure), which shows that the right vas, the right vesicle, and the right ejaculatory duct are patent. Specimens of the spermatic fluid contained living spermatozoa, and it became clear that these were coming from the right testicle only.



Radiogram showing sodium iodide injected from a catheter into the right seminal vesicle and vas.

This is in all probability the first radiogram taken in this country on the living subject of the seminal vesicle and vas by means of a catheter. The method has become available owing to the genius and determined zeal of Dr. Joseph McCarthy, of New York, and Mr. Reinhold Wappler.

The first invention that made this manipulation feasible was that of the Foroblique telescope which gives a view of the verumontanum and deep urethra from an entirely fresh angle as compared with the older urethroscopes. Even with this telescope catheterisation was not possible until the invention of an ingenious double cannula which holds the catheters and ends in two little spring wheels. The catheters run round these wheels and emerge laterally and then run forward so as to point directly into the entrance of the ejaculatory ducts. The ejaculatory ducts have been catheterised previously in the living subject with other instruments, but the manipulation has been a very difficult one, and in the majority of cases not only unsuccessful but liable to cause damage to the ducts. With McCarthy's instrument the manipulation is not a difficult one to carry out by those accustomed to catheterising ureters, and it does no damage to the delicate structures involved. McCarthy has already carried out these catheterisations in a large number of cases, and is engaged in an intensive study of the living anatomy of the vas and vesicles.

I am indebted to Dr. Malcolm Simpson, of St. Paul's Hospital, for furnishing me with this case, and to Dr. Mather Cordiner and his assistant Mr. W. Mo[illegible] of the same hospital, for taking the radiogram.

I have now catheterised the ejaculatory ducts with this instrument in eight cases, and think that attention should be called to the possibility of the manipulation. Suitable cases need very careful selection, and must be prepared for the [illegible] by a course which includes the passage of large metal bougies and the instillation into the deep urethra of strong silver nitrate. It is hoped that the method will prove useful and be indicated in those who wish to know if their ejaculatory ducts are patent after prolonged attacks of vesiculitis and in those cases of vesiculitis in which it is necessary to know if [illegible] area remains in the vesicle where infected secretion may be shut up and likely to be a source of reinfection at a later date. Also it is hoped that it may be possible to wash out the vesicles by this method and cure chronic cases of vesiculitis.

Nevertheless I feel that after some years' further experience it is likely to be found that disinfection of the vesicles can be more readily acc[illegible] and with less risk of setting up epididymitis by m[illegible] of open vasostomy after the method of Belfield which permits of lavage of the vesicles from above. [illegible] have carried out this method with almost unifo[illegible] success in more than 70 selected cases as described in previous papers.[1]

THE VITAMIN B_2-POTENCY OF COMMERCIAL LIVER EXTRACT.

BY B. C. GUHA, M.SC., PH.D.,
TRAVELLING FELLOW OF THE UNIVERSITY OF CALCUTTA;
(From the Biochemical Laboratory, University of Cambridge)

IN course of a search for a potent source of vitamin B_2, it was found that Eli Lilly's commercial liver extract No. 343 would produce good growth in rats kept on a vitamin B_2-deficient diet in doses as small as 40–60 mg. On the other hand, it is comparatively poor in vitamin B_1, for it produces subnormal growth in B_1-deficient rats in doses of 120 mg. The commercial liver extract, as a raw material for the concentration of vitamin B_2, has thus several advantages over yeast. It is richer in B_2 than yeast and poorer in B_1. It provides a more easily manipulable material. Moreover, nearly all the vitamin B_2 in it can be extracted with cold water.

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[1] Kidd, F.: THE LANCET, 1923, ii., 213, and 1928, ii., 25; Brit. Jour. Ven. Dis., 1930, vi., 79.

Among the rats which were kept on a vitamin B_2-deficient diet for over nine weeks, a large proportion developed a curious form of depilation. The fur fell off in a manner such that the animals developed a "close-cropped" appearance, without there being any bare patches on the skin. Within four to five days of the feeding of the liver concentrate the fur began to lengthen and soon resumed the normal "lying-down" appearance. A very minor proportion of the animals developed lesions in the feet and paws and near the mouth, and in those that did, these symptoms cleared up very rapidly under administration of the liver extract.

It thus appears that the commercial liver extract, besides being a rich source of the pernicious anæmia factor, is extremely rich in the pellagra-curative factor. It should presumably provide a better material than yeast for the cure of human pellagra.

As it is not yet clear that pellagra is due to a simple deficiency of one factor, it is suggested, in order to have greater clarity in this domain of research, that the factor, which is assayed by means of rat growth tests, be called vitamin B_2, while the factor or factors which are specifically concerned with the cure and prevention of experimental pellagra in rats and which are assayed by means of curative and preventive tests, be called the P–P (pellagra preventive) or the A–P (anti-pellagra) factor. This provisional arrangement would probably prevent some confusion.

MEDICAL SOCIETIES

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY.

AT a meeting of this society, held on April 9th, at Chandos-street, W., the chair was taken by Dr. O. H. WOODCOCK, the President, and Dr. LANGDON BROWN opened a discussion on

Anorexia Nervosa.

He put forward anorexia nervosa as a pathological example of the painful process of detachment of the individual from its parents. The name had been given to the condition in 1873 by Sir Wm. Gull, who had previously described it in 1868 as apepsia hysterica. He had recognised the importance of the mental state and had called attention to the slow pulse- and respiration-rates, the clean tongue, and the incidence in young women between 16 and 21. The prognosis he had regarded as good, saying that there was hope as long as life lasted. Dr. Brown also quoted the graphic descriptions of Gee and Clifford Allbutt, and said that the condition was not uncommon. Anorexia was usually profound and was rationalised on one of three grounds: humanitarian grounds, the desire for slimness, or religious grounds—more often in the rare male cases—allied to a repugnance against all bodily functions. After a time the inability to take food became genuine, owing to atrophy of the digestive organs. The practitioner must always be on the look-out for clever ways of disposing of the food. It might be given to animals, or hidden in curious places such as the piano. Constipation was invariable and should be treated by paraffin and agar, and never by drastic aperients. Amenorrhœa was always present, and the return of the periods was a good sign. Wasting was extreme, and the skin had a rough, dry character. The facies was either resigned or frightened and the nose congested; the cheeks were cyanotic, and the hands cold and blue. The expression was childish for the patient's age.

Patients generally admitted reluctance to grow up, and usually showed undue dependence on the father and hostility to the mother; the latter might be concealed by an exaggerated show of affection, with constant opposition on small points; it might be admitted in the mother's absence, or might be quite frank. Dr. Langdon Brown described the four male cases he had met. One of them had developed tuberculosis and died; this disease was a constant danger to these patients. Another had had a violent antipathy to his mother and to milk in any form: he had been a homosexual. In all cases the trouble had arisen from a perverted attempt at sublimation, and this origin was probably more common than was realised. The protest against swaddling-clothes was more likely to appear when the patient experienced a conflict between the two urges in life. Behind anorexia nervosa sometimes lurked the shadow of dementia præcox, though the subject of anorexia was often extraverted; if introversion occurred in such a case the prognosis was bad.

INFANTILISM.

Keith had remarked that the tendency to carry infantile characteristics into adult life had played a large part in human evolution. But just as this might be a source of strength, so it might prove a weakness. Everyone tended to grow up in patches. The infantile psychical attitude in the psychoneurotic was the manifestation of a characteristic which had a high evolutionary value.

Dr. F. G. CROOKSHANK remarked that the work on this subject had all been done within living memory, and described a fatal case he had seen in 1892. At that time the condition had been commonly supposed to be the result of latent tuberculous infection: no advance had been made on the psychological side. He was quite sure that the cases were much more frequent in certain cultural and religious milieux than in others. They were seen by physicians rather than by psychologists—often only a few days before death. Most cases had had some form of vaccine treatment based on irregularities of the intestinal flora, and many had been in sanatoriums for calcified glands at the hilum. The age-incidence was not a rigid one; refusal of food might occur in various types of mental case. There was, however, a difference in psychology between the adult case and the typical adolescent case as described by Gull. Anorexia nervosa might also be seen in children. In the typical case the individual had long shown signs of negativism and digestive disturbance, the mother having paid special attention to the alimentary tract from an early age. The condition did not break out suddenly; there was alimentary organ inferiority. Possibly marasmus in babies might provide precocious examples.

C. Lasègue had written an important paper in 1873 describing ten cases. He had restricted the age to 15 to 20, and had seen both male and female cases. While appreciating the psychological origin and nexus, he had not gone so far as to suggest investigation of the past. He had mentioned strong emotion and contrariety. Several people had remarked on the importance of the marriage of a younger sister. Dickens had drawn an example in Sarah Crewler, mentioned in "David Copperfield." Most of the cases had been an only child or a rival child. Lasègue had stressed the importance of studying both patient and entourage, as they were Solidaires. He had also pointed out how the patient was "trained" by the environment to produce the symptoms.

Dr. Crookshank's impression was that the fathers of female patients were weak rather than dominating. The mothers who identified with their daughters in this way were not having a satisfactory sexual life and all their libido went to the supervision of the daughter. They were smothering mothers. The children shrank from growing up because they knew that they were incapable of taking their place among their contemporaries, owing to this smothering process; they longed to get out. It was doubtful how far the sexual element entered into these cases; the patients took to masturbation in the later stages, but it was not a primary condition. The purposive character of the manifestations had been recognised by Lasègue, who had divided the progress into three stages. The first was ushered in by some acute complaint—some severe dyspepsia. Then the patient began to say that she could not eat because of the pain; it was important at this stage not to declare that she "ought" to eat, as this drove her into a campaign of hostility, which she conducted with cunning and implacability. She should be treated gently. The second stage was that of systematisation or organisation, where the patient had her scheme mapped out and began to triumph. She suffered no more, led an active life without thirst or amenorrhœa, and ate just what she liked. She would not make the slightest concession, as that would admit caprice, and any insistence only increased her resistance. The third stage was marked by thirst and amenorrhœa, and then the patient became alarmed and would accept treatment if the doctor had been wise during the earlier stages, or would go to another doctor. No patient developed tuberculosis unless she had been discouraged; it had a definite psychological basis.

The refusal to eat might be analogous to the wild flying about of a bird in a room: a primitive behaviour which eventually found the way out. Animals suffered from anorexia nervosa. It might be a revolt against loss of liberty. The greatest psychological force active in these cases was resentment at loss of liberty. The art of treatment lay in managing both patient and mother and in separating them at all costs. Relapses were rare. Anorexia nervosa over 30 was really constructive suicide.

Dr. LANGDON BROWN mentioned two adult cases in married women. One was a remarkable example of the "relentless campaign," and had succeeded in starving herself to death; her husband had denied her the children for which she had longed. The father was often weak—"a darling"—but in some cases he was very well balanced.

The CHAIRMAN mentioned a girl who had nearly died of anorexia nervosa but had recovered after her father's death and become a great traveller.

Dr. JAMES YOUNG said that anorexia nervosa was a profound reaction against authoritarianism, and quoted a case where the patient had recovered but had subsequently developed dementia præcox. An allied condition had been seen in a girl who had had attacks of over-eating, after which she would take an emetic and fast for several days. The father and mother had disagreed and he had left the home when she was six. She had had a terrible time later with a stepmother and younger stepsister, and had begun to fast from the time when she had been wrongly accused of pregnancy. It had been an attempt not to be a woman any longer. J. F. Venables's cases all seemed to arise from fear either of the father or of Jehovah—i.e., fear of sex.

Dr. C. SCHIFF thought that there must be some profound reason for the amenorrhœa. It might be due to some central lesion—some refusal of the whole body—common to it and the anorexia. The condition occurred in decades and in people when the bodily functions were particularly despised. The association with asceticism in history was interesting.

Dr. LANGDON BROWN said that there might be a gonadal hypofunction accounting for the amenorrhœa. The fear of nocturnal emissions after a large evening meal might be the start of anorexia. Sexual suppression was, however, a minor factor.

Dr. CROOKSHANK pointed out that amenorrhœa only appeared at the third stage.

Dr. M. MARCUS described a case under his care. Her improvement had begun from an engagement but had continued although the engagement had been broken. Another girl had admitted annoyance at the engagements of her brother and sister; she had had an adoring father and a nagging mother. A third patient had shown the typical first stage of pain; her mother had swaddled and spoiled her, but the father had now decided to send her away from home.

Dr. J. R. REES asked why older cases were to be regarded as suicidal; was the type different, or was the patient hopeless? He also asked what was the value of symptomatic treatment.

Dr. LANGDON BROWN said that Sir Wm. Gull recommended "the treatment suitable for of unsound mind." Glucose and insulin might useful, but the chief lines were separation from parent, moral suasion, and filling the bowel roughage.

Dr. CROOKSHANK said that the apparent of the plan in adolescence was to achieve independence, and the best way to treat the patient was to hold hopes of that independence. The older cases were against a dead-end and wanted to die. Brud Carter, in his book on hysteria, recognised the psychological basis to an astonishing extent, but he regarded the circumstances as perfect and attemp to break the patient to them, whereas the modern therapist tried to modify the circumstances.

Dr. G. GORDON described mild cases among men over 30 in suicidal wards. He thought that they were all patients who were in hospital under protest. Their refusal of food was an anti-authority protest, and he had treated it by trying to get them to make friends with the hospital and realise the amount of liberty allowed. The condition might arise from protest against any authority—even a Government department.

Dr. S. D. ISAACS described a case in a married woman who had intensely disliked sexual intercourse, and had began to refuse food after procuring an abortion. Some 20 years later she had developed septic teeth, with complete disorganisation of the digestive tract. She had always shown intense obstinacy.

Dr. E. L. TAYLOR described an adult case occurring after the fifth pregnancy, which had been complicated by threatened eclampsia. The history showed tragic domination and dislike by the mother, cruelty in childhood, seduction by her first employer, and repeated pregnancies. She could not face the future and was refusing food, although protesting that she must get better to look after the children.

Dr. **BEVAN BROWN** doubted whether the condition was always a protest against authority. He had known cases where the first reaction was a feeling of being superfluous and unloved; later the mother tried to make up for her failings and became "smothering." The degree of lack of insight might approach that of dementia præcox. Patients often vomited if they ate or were forced to eat a little more than they thought correct.

Dr. **CROOKSHANK** said that the feeling of not being wanted was common to almost all neuroses; the protest against authority was more peculiar to anorexia nervosa.

BRIGHTON AND SUSSEX MEDICO-CHIRURGICAL SOCIETY.

AT a meeting of this society on April 4th, with Mr. H. **NETHERSOLE FLETCHER**, the President, in the chair, a paper on

Acute Intestinal Obstruction

was read by Mr. J. R. H. **TURTON**. He began by presenting statistics of 300 cases of acute obstruction admitted into the Royal Sussex County Hospital during the past ten years—96 of these being cases of obstruction from intra-abdominal causes, and 204 cases of strangulated hernia. The total mortality proved to be about 30 per cent.—52 per cent. for the internal cases and 20 per cent. for the hernias. It was found that the average age of the former group was 49 and of the latter 59 years, and the duration of acute symptoms before hospital admission was 2 days 20 hours, and 1 day 21 hours respectively. The highest mortality-rates were among cases of internal hernia, carcinoma of the colon, and multiple adhesions, while the lowest rates were among cases of obstruction caused by a single band or by impacted gall-stones. The average duration of acute symptoms before admission differed widely among the different classes of obstruction, and the different mortality-rates in the several classes could not be attributed to the different periods of delay in their diagnosis. Among the strangulated hernias, the mortality was 22 per cent. for the inguinal (91 cases), 12 for the femoral (90 cases), 44 per cent. for the umbilical (16 cases), and 43 per cent. for the ventral (7 cases). The mortality among the femoral cases in the female was especially low—64 cases with four deaths. Of these four cases, two were late ones, each having been strangulated six days and necessitating resection of the bowel for gangrene; one was a case of toxic goitre which proved fatal suddenly three days after operation; and the fourth a case of chronic nephritis in which the cause of death was suppression of urine. Fæculent vomiting was present in 24 per cent. of the internal cases (mortality 56 per cent.), and in 16 per cent. of the hernia cases (mortality 50 per cent.). Of the 40 cases in which obstruction was due to adhesions, 21 had undergone previous abdominal operation, and in all of these the obstruction was a direct sequel.

Mr. F. E. **FEILDEN** showed a case of intestinal obstruction due to a malignant adenomatous polyp occupying the lumen of the jejunum.

LIVERPOOL MEDICAL INSTITUTION AND MANCHESTER MEDICAL SOCIETY.

A JOINT meeting of these societies was held at Liverpool on March 5th, when Mr. **GEOFFREY JEFFERSON** read a paper on the

Surgery of the Pituitary Body.

After referring to the two main groups of pituitary dysfunction, he spoke of the symptoms once regarded as of pituitary origin but which now seemed to be tuberal. Striking hypopituitary pictures might be induced, he said, by tumours at a distance—notably by those in the cerebellum with retention dilatation of the third ventricle and damage to the hypothalamus. The acromegalic group of cases were no longer the most important clinically for they represented the minority of pituitary enlargements. In this disease the glandular change was not a true tumour, but a hypertrophy with toxic secretion. The commoner chromophobe adenoma appeared to be a true tumour and produced its effects by interfering with the normal pituitary secretions. Mr. Jefferson thought that too much attention was paid in teaching and discussion to the somatic effects of pituitary tumours. These required some time for their development, and an adenoma might become large enough to cause blindness by compression of the optic nerves before any gross signs of general body change made their appearance. He thought this fact ought to be more widely known because the diagnosis of pituitary tumour was often very considerably delayed or missed altogether because of the absence of those signs which the clinician had been taught to expect in pituitary lesions. Conversely it seemed to him that the most obvious pictures of hypopituitarism were given by persons who had no pituitary tumour at all. In these some infection or acute illness seemed to have damaged the gland. At all events it was unwise to diagnose tumour on somatic changes alone.

Mr. Jefferson said that at operation he was using the trans-frontal route as worked out by Frazier and Sargent, but he thought that for the moderate-sized cyst the trans-sphenoidal route was safer. The difficulty was to know beforehand which was the better route for any given case. The risks of post-operative hyperthermia were certainly less by the nasal route, but it was an unsatisfactory approach for the more solid tumours.

Sanocrysin.

Dr. H. T. **ASHBY** read a paper on the Treatment of Pulmonary Tuberculosis in Children by Sanocrysin. This drug, which was introduced in 1925, was not received favourably, he said, when first tried in this country, the reason being that it was used in unsuitable cases and given in too large doses. As time went on its value as an adjuvant was being more widely recognised. It was best used in the so-called exudative type, where there was a fresh area of spreading disease, and was unsuitable for abdominal or renal tuberculosis. Sanocrysin was well tolerated by children and was given them by intramuscular injection of a 3 per cent. solution, the initial dose being 0·01 g. A course consisted of 10 to 12 injections with a maximum dose of 0·5 g. With these amounts the children had been entirely free from undesirable symptoms and most had shown an increase in weight and steady improvement of symptoms. The dangers to watch for were diarrhœa and albuminuria. The results, especially in severe cases of bad prognosis, were often such as to encourage a prolonged trial of sanocrysin combined with the usual methods of treatment. It was not a specific but it often helped to shorten the illness.

Stone in the Ureter.

Mr. J. B. MACALPINE said that large stones in the ureter could be diagnosed by X rays alone, but the presence of small ones must be confirmed by cystoscopy, since there were many radiological pitfalls. A stone might be invisible because of its small size or permeability to X rays, and there were many shadow-casting objects round about the ureter which might cause confusion. The speaker showed plates in which an opaque bougie acted as a pointer, its tip abutting on the stone, or passed close to the stone and demonstrated the close apposition of the two. Shifts of the X ray tube and re-exposure would, he said, make this relationship more convincing, or stereoscopy might be employed. Pyelography, by outlining the ureter, demonstrated that the shadow was within its lumen. Where a stone was transparent it might be seen in the pyelogram as an area of diminished opacity.

REVIEWS AND NOTICES OF BOOKS

Zehn Jahre Forschung auf dem Physikalisch-medizinischen Grenzgebiet.

Edited by Dr. FRIEDRICH DESSAUER, Director of the Institute for the Physical Elements of Medicine, University of Frankfurt-am-Main. Leipzig: Georg Thieme. 1931. Pp. 403. M.36.

THE valuable work carried out at the Institute for the physical basis of medicine, in Frankfurt, is already known in this country through the publications of papers and extracts in English medical journals, but we owe gratitude to Prof. Dessauer, the Medical Director of the Institute, for publishing in book form this series of 15 original researches in honour of the tenth anniversary of the foundation of the Institute. The Frankfurt Institute was founded at a time when it seemed almost impossible to raise the necessary funds for an institution which promised no immediate returns for an investment. It arose in answer to a conviction, which has been gaining more and more ground in medical and scientific circles, that physics could become as useful to medicine as chemistry had already become to biology. The lack of trained workers possessing a sufficient knowledge of medicine and also of physics in its more recent developments was painfully obvious. The Institute was designed to train the workers it required, and by its affiliation to the faculties of medicine and science it facilitated the coöperation of experienced clinician with expert physicist. We are told by Dr. Dessauer that the work chosen for publication in the present volume in no way represents the total output of work done at the Institute, and when we remember that the Institute has been in constant financial difficulties almost since its foundation, owing to the loss of its original endowment, and that it has had to be self-supporting by the manufacture of scientific instruments and the organisation of classes and consultations, we must admire the ingenuity of the directors and the devotion of the medical and scientific staff which enabled them to do such good work under difficult circumstances.

Of the various researches reported in this volume the most important one, to which most space has been allocated, is a study of the effect of exposure of normal subjects and selected patients to an atmosphere carrying a measured number of either positive or negative ions. This study was suggested by observations on atmospheric susceptibilities of various individuals, by the symptoms observed during changes of altitude and exposure to various winds, by mountain and Föhn-sickness, and by the dependence of rheumatic manifestations on weather and climate. An underlying physical factor was suspected. The research which is here published makes it abundantly clear that the number, size, and positive or negative charge of the ions in the inspired air are among the factors determining the effect of climatic conditions on the welfare of the individual. Inhalation of air containing negatively charged particles was found to cause a fall of blood pressure in patients with raised blood pressure, the fall being often marked and always accompanied by relief of subjective symptoms. In normal subjects a *feeling of freshness* and absence of fatigue and in cases of subacute and chronic rheumatism exacerbations of symptoms and sometimes of local signs, associated with subsequent improvement in a certain number of cases was also noted. Inhalation of air carrying measured quantities of positively charged ions caused untoward symptoms in cases with raised blood pressure, and often marked distress associated with a further rise in blood pressure. Other researches include: studies on the fundamental biological reactions of radiation and on detection and measurement of the mitogenetic rays of Gurwitsch; measurements of the transmission of radiation through the skin and tissues and of intensity distribution in irradiated media; electro-magnetic measurements for study of the superficial strata of the soil; and many investigations of new and old apparatus for measurement of radiations of various wave-lengths. An index of the investigations published by the Institute since 1920 occupies 10 pages of small print, a remarkable output of work.

Modern Methods of Treatment.

Fourth edition. By LOGAN CLENDENING, M.D. London: Henry Kimpton. 1929. Pp. 819. 42*s*.

Dr. Clendening's manual of treatment was first written to provide an outline of all the methods of treatment used in medicine, and in this—the fourth—edition his intention has not been changed. He has aimed at supplying details, not only of dietetic and drug therapy, but also of such procedures as blood transfusion, hydrotherapy, artificial pneumothorax, and the like; so that the reader might be enabled to carry out the technique without actually having ever seen the treatment applied. The first section of the book is taken up with drugs and dietetics; the latter section is particularly full, and many of the practical instructions given are not easily found in other books. The chapters on Infant Feeding, written by Dr. Cowherd, contain much useful information. The action of drugs is considered first from a pharmacological standpoint; their application in particular diseases is discussed in the second part of the book. Chapters are included on medical gymnastics and massage, exercise, electrotherapeutics, radiotherapy, and other physical lines of treatment. For the most part descriptions are concise and brief.

On the whole, the chapters are well balanced, and there are few omissions. The book is more than a mere work of reference. It is written in a direct and simple manner, with some excellent quotations from original papers, and makes interesting and, in places, entertaining reading. There are numerous illustrations and diagrams, some of which are of an elementary nature and might have been omitted, and a few references are given at the end of individual chapters.

Dr. Clendening is to be congratulated upon the large amount of valuable information which he has collected. The index is excellent. This fourth edition follows closely upon the third. Among the new methods of treatment included are desiccated swine stomach in pernicious anæmia, the parathyroids, and Calmette's B C G vaccine.

Diseases of the Thyroid Gland.

By NELLIS BARNES FOSTER, Associate Professor of Medicine, Cornell University Medical College; with a section on *Malignant Growths* by EUGENE H. POOL, Attending Surgeon, New York Hospital. London: Baillière, Tindall and Cox. 1930. Pp. 174. 6*s.*

INTO the short space of 170 odd pages Prof. Foster has condensed all the important facts which the student should know about thyroid disease, or which the general practitioner will require for the diagnosis and treatment of his cases. Chapters are included on thyroiditis, goitre, tuberculosis and syphilis of the thyroid, athyrosis and hypothyrosis, and exophthalmic goitre. Prof. Pool, of Columbia University, has collaborated in the final chapter on Malignant Growths of the Thyroid. There is little to criticise in the subject matter of the book, and its arrangement and size are thoroughly satisfactory. It should find as wide an acceptance in this country as it has already done in America.

The Complete Law of Housing.

By H. A. HILL, B.A., Barrister-at-law. London: Butterworth and Co., Ltd. 1931. Pp. lviii. + 394. 25*s.*

Mr. Hill's "Complete Law of Housing" contains the text of the 1930 Act and the unrepealed parts of earlier Housing Acts. The introduction tells the history of the legislation and includes a sensible analysis of the slum problem. There is a reasonably complete appendix of Statutory Rules and Orders and other documents. The Treasury Minute which fixed the rate of interest under Section 90 (6) of the 1925 Act is not cited; perhaps it was not deemed of general importance. These regulations and orders soon fall out of date; already, since the book went to press, the Ministry of Health (Rate of Interest) Amendment Order of last April has been superseded. The annotations to the statutes will be found serviceable. Is it accurate to say that the words "clerk or" in Subsection (4) of Section 69 of the 1909 Act were repealed by the 1925 Act? Parliament doubtless meant this to happen, but muddled the reference. On page 28 Mr. Hill prints Section 11 of the Housing (Additional Powers) Act, 1919, as though it explained "local authority" in the only other section printed above it. Is not this misleading? Section 11 was required for various other sections now dead; can it modify the local authorities in the 1916 Act to which Section 8 refers? There is a useful note on page 190 where the editor calls attention to an ambiguity in Section 9 of the 1930 Act; his interpretation seems to differ from that of the department. The views of the joint author of "Hill and Oliver's Local Government Act, 1929" are entitled to consideration. His new book will help those to whom the impact of the 1930 Act upon the 1925 Act (as contrived by Section 63 of the recent statute) is not too simple a matter.

Warren's Handbook of Anatomy.

From Original Dissections by JOHN WARREN, M.D., late Associate Professor of Anatomy, Harvard Medical School. Text by ROBERT M. GREEN, M.D., Assistant Professor of Applied Anatomy at Harvard Medical School. Published by Harvard University Press. London: Humphrey Milford, Oxford University Press. 1930. Pp. 384. £3 3*s.*

THIS volume has been compiled by the Harvard colleagues of the late Prof. Warren, in order to complete the work on which he had been engaged for several years before his death. It has been built up round the dissections and drawings left by him to the Anatomy Department in which he worked. The drawings, made for the most part under Prof. Warren's supervision, are from the pencil of Mr. H. F. Aitken, and form an outstanding feature, being beautiful reproductions. The text is clear and simple. The first year's course in anatomy, which the book is said to meet, is not the same as the first year's anatomical work in England, so that it is no reflection on this book if we say that it does not, in our opinion, go far enough in its scope to take the place of any of the current text-books or manuals in use in this country. The same line of criticism might be applied to it from the clinical side. Nevertheless, the volume is a pleasing one, and is very well produced.

Developmental Anatomy.

A Text-book and Laboratory Manual of Embryology. Second edition. By LESLIE BRAINERD AREY, Robert Laughlin Rea Professor of Anatomy, Northwestern University. London: W. B. Saunders Co., Ltd. 1930. Pp. 563. 27*s.* 6*d.*

THE first edition of this book, which was an elaboration of Prentiss and Arey's manual, was reprinted several times, and was one of the best of what might be termed "formal" embryological books. This issue, however, is much more than that. The recognition and inclusion of work previously ignored, and the addition of reference lists to the chapters, have given it a value much higher than it possessed before. Moreover the careful re-writing of the subject matter throughout has, with the changes mentioned, lifted the work to the rank of a book of reference to be used by others than those who are professedly students. We welcome its appearance.

Tobacco.

By W. L. MENDENHALL, M.D. Harvard University Press. 1930. Pp. 69. 4*s.* 6*d.*

THIS is one of the "Harvard Health Talks" and is given by the professor of pharmacology in the Boston University School of Medicine. It is a very reasonable review of the facts about tobacco-smoking as far as they are known. It is an expensive habit, bad for the pharynx, duodenum, and heart and, in the young, *associated with loafing and inferior scholarship.* Evils are possible but not certain, and everyone must make up his own mind whether the habit is worth while. The author would perhaps have cleared the discussion a little more if he had distinguished between the effects of tobacco on young persons and on those whose bodies are beginning to be particular about the treatment they receive.

X Ray Technology.

The Production, Measurement and Applications of X Rays. By H. M. TERRILL, Ph.D., Associate in Physics, Institute of Cancer Research; and C. T. ULREY, Ph.D., Research Physicist, Westinghouse Lamp Company. London: Chapman and Hall. Pp. 256. 21*s.*

THE authors state that it has been their aim to lay stress upon the "practical rather than the theoretical aspect of X ray measurements." They are to be congratulated on the result. Their great experience in this field has enabled them to produce a book which should prove valuable to the radiologist and physicist alike. In 11 chapters they deal clearly and concisely with X ray tubes and their practical operation, measurements of current, voltage, ionisation, total energy and wave-length, X ray analysis of crystals, radiography, and biological measurements. While the information given is of the practical kind required by every X ray worker, the theoretical basis of the measurements is never lost sight of. The printing, paper, and illustrations are all excellent.

The Spiritual Life Viewed from a Scientific Standpoint.

By T. STACEY WILSON, M.D., F.R.C.P. Birmingham: Cornish Bros. 1930. Pp. 50. 1*s.*

Dr. Wilson hardly looks at the spiritual life from the point of view of a scientific man. He does what several others have done in recent years and writes in a very helpful way to affirm his experience that the scientific training and life of a medical man is in no way incompatible with the enjoyment of spiritual values to the full. To love one another is man's highest achievement. This cannot be proved by any process of reasoning which can be called a scientific argument; if we believe it to be true, it is on the strength of experiences such as Dr. Wilson summarises.

The Papyrus Ebers.

Translated from the German version. By CYRIL P. BRYAN, M.B., B.Ch., B.A.O., Demonstrator in Anatomy, University College, London. With an Introduction by G. ELLIOT SMITH, M.D., D.Sc., Litt.D., F.R.C.P., F.R.S., Professor of Anatomy, University College, London. London: Geoffrey Bles. 1930. Pp. 167. 10*s.* 6*d.*

THIS is the first rendering in the English language of what the translator firmly claims to be the most ancient book in the world. It is certainly the longest and most famous of the documents relating to the ancient practice of medicine. Prof. Elliot Smith, in his delightful introduction, deplores the assumption even by the most learned historians that the history of medicine began with the Greeks, and that before the time of Hippocrates there was little or nothing that can be called a science of medicine. And here is a book written about 1500 B.C. which shows that there was at that time considerable knowledge of the diagnosis and treatment of disease. Prescriptions for different diseases, specifying the name of the drugs, many of which are in common use at the present day, the dosage of each, and the method of administration, are to be found there; also some observations on diagnosis and on the surgical treatment of wounds and suppurating sores, interspersed, of course, with spells and incantations. Dr. Bryan deserves congratulation for his energy and skill in providing this excellent translation and commentary. Prof. Elliot Smith's hopes that it may stimulate students of folk-lore and archæology, of herbals and theology, to be alert for clues which will provide information for the identification of diseases and drugs, and for an illumination of the principles underlying the ancient physician's methods of practice.

Sixty Centuries of Health and Physick.

By S. G. BLAXLAND STUBBS and E. W. BLIGH. London: Sampson Low, Marston and Co., Ltd. 1931. Pp. 253. 15*s.*

IN a review of this book published in THE LANCET of April 4th (p. 762) we regret that the title was incorrectly given.

British Journal of Children's Diseases.

IN the January-March issue (Vol. XXVIII.) Dr. Leopold Mandel distinguishes five types of enuretics, viz.: (1) Those children in whom some palpable physical irritating stimuli exist, such as worms, over-distension of the bladder, or cystitis. In such cases the treatment is obvious. (2) The hypersensitive or neuropathic type, which responds to dietetic and medicinal measures combined with readjustment of environment and gentle re-education. (3) The so-called psychopathic child, in whom the enuresis is more a behaviour complex, and the treatment required is for the most part psychological. (4) Endocrine dysharmony, particularly hypothyroidism leading to a loss of inhibition. In such cases small doses of thyroid with pituitrin as an adjuvant are indicated. (5) The debilitated child, often convalescent from some illness, for whom general tonic treatment is indicated. In all types atropine or belladonna is the specific drug of choice.—Dr. F. Parkes Weber reports a case of Complete Mindlessness (Lowest Degree of Idiocy) and Cerebral (Cortical) Diplegia after Status Convulsivus Associated with Ether Anæsthesia, and gives references to other cases of severe and dangerous convulsions in children following ether anæsthesia or alcoholic drinks.—In a paper entitled Measles Encephalitis: Two Fatal Cases, Dr. E. C. Benn records cases in a girl aged 8 and a boy aged 5 years. The first case was unusual in that acute encephalitis occurred on the reputed third day of illness within 24 hours of the appearance of the rash after an apparently normal onset of the disease. Death took place within 25 hours of the onset of cerebral symptoms. Both cases showed signs of severe and widespread cerebral damage, and the prognosis was hopeless from the first. Typical histological lesions were found in the brain in each case.—Dr. John Craig and Dr. Alexander Lyall report a Case of Calcinosis Universalis and a Suggested Method of Treatment. The patient was a girl aged 5 years, in whom after all other treatment had failed, the administration of di-sodium phosphate, first in half drachm doses thrice daily, and then in one drachm doses four times a day led to rapid disappearance of the calcinosis.—In a Note on Congenital Developmental Diseases, Dr. Parkes Weber emphasises the need of an atlas showing, by means of photographs, skiagrams, sketches, and diagrams, all the macroscopic structural features met with in the various hitherto recorded types and combinations of types.—The abstracts from current literature are devoted to tuberculosis.

THE LANCET.

LONDON: SATURDAY, APRIL 18, 1931.

HUNGER PAIN.

OF all the symptoms associated with disorder of the stomach hunger pain is the most important, for it at once arouses suspicion of an organic lesion close to the pylorus. This fact, whose enunciation we owe first and foremost to Lord MOYNIHAN, has made it possible during the last 30 years to diagnose and treat peptic ulcer with precision, whereas previously the condition remained undetected among the congregation of symptom-complexes known as dyspepsia. It was long supposed that hunger pain was the expression of an excess of free hydrochloric acid in the stomach, and this was the dogmatic teaching of authorities such as C. A. EWALD, F. RIEGEL, and S. and V. S. FENWICK. Their opinion was almost universally accepted, and is indeed the basis for the recognition of "hyperchlorhydria," which, on insufficient grounds, is regarded by many as a disease. More recently clinicians have been largely converted to the belief that excess of acid is only an indirect cause of the pain in that it sets up painful contractions of the gastric or pyloric muscle. Now, however, a small but influential body of opinion goes further and has come to hold that the acid factor has little if anything to do with the genesis of hunger pain, considering that hypertonus of the stomach and pylorospasm alone are causes of pain, and may be present without any increase in the acidity of the gastric contents. Of workers in this country, T. I. BENNETT, J. A. RYLE, A. F. HURST, and I. T. VENABLES, may be quoted as among the more prominent exponents of this view.

A valuable contribution to the mechanics of hunger pain has just been published by OLINE CHRISTENSEN.[1] Like A. J. CARLSON and his pupils she has followed the method of W. BOLDYREFF, which, in addition to gastric analysis and radiography, consists in introducing a balloon tube into the stomach so that a continuous record of gastric tonus and movement can be obtained. By these means she has collected a large series of observations both of the normal and of various pathological conditions. The investigation of normal subjects confirms the existence of periods of vigorous contraction alternating with almost complete rest. The presence of a sufficient amount of gastric contents, either in the form of food or of gastric secretion alone, produces a change in the contraction curve, weaker contractions replacing the previous vigorous ones. In some normal persons 200 c.cm. of water is enough to cause this change; but in the majority a larger amount of water is required. A food which promotes vigorous gastric secretion is the most effective in diminishing the fasting contractions; while a mixture of egg and milk was found to be the substance best calculated to produce gastric rest. Examination of patients suffering from various diseases reveals that typical hunger pains are always associated with vigorous contractions of the stomach when it is empty or very nearly empty, but such contractions are not necessarily greater in amplitude than those previously observed when larger amounts of food were in the stomach. The relief of hunger pain is due to the reduction of such contractions which occurs in the presence of an adequate gastric content. Titration of samples of the gastric contents shows that the concentration of free hydrochloric acid bears no relation to the vigour of the painful contractions in such cases. As in her purely physiological observations, CHRISTENSEN noted that egg and milk was the food which most readily caused relative gastric rest and an abolition of hunger pain.

Much of this new work is a repetition of CARLSON'S classical observations, but other parts form an ample and scientific corroboration of the opinion long expressed by some of the physicians studying this particular subject. Actually it is of high importance because it lays stress on the extreme utility of rest in the treatment of gastric disorders. W. C. ALVAREZ has written :—

> "One of the lessons to be learnt by the clinician from the work on hunger contractions is that he cannot put the stomach at rest simply by withholding food. Actually, in the presence of an ulcer, the powerful hunger contractions are much more disturbing, and probably more harmful to the patient, than are the waves that course over the lower end of the stomach during the periods of digestion; and certainly, one of the easiest ways in which these patients can be kept comfortable, is by giving them something to eat every two hours."

The value of alkalis in the treatment of gastric ulcer has been emphasised, and probably over-emphasised, during the last decade. While an ulcer bathed in strong gastric juice must necessarily be in a bad medium for healing, it is clear that rest is the all-important factor, as HURST, BENNETT, RYLE, and others have long insisted. Comprehension of the mechanism of hunger pain is necessary before one can understand how gastric rest should be sought and attained.

EARLY MAN.

Sir ARTHUR KEITH, the Conservator of the Museum and Hunterian Professor at the Royal College of Surgeons of England, has added an important volume to his well-known treatise, The Antiquity of Man. This made an original appearance some 15 years ago, and ten years later was reissued in two volumes, the expansion registering the great accession to our knowledge of ancient man which occurred between 1915 and 1925. These volumes were themselves published in revision four years later, but such has been the rate of advance during the last two years that a new book has been necessitated containing a record of the more recent discoveries and analysing their bearing upon the problems of man's evolution.[1]

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[1] Pathophysiology of Hunger Pains. By Oline Christensen. Collected papers from the Medical University Clinic B. Edited by Knud Faber. Copenhagen. 1931.

The earlier part, about a quarter, of the new book, is concerned with the discovery of the Taungs skull near Kimberley in South Africa, which more forcibly than any other event in palæontology propounds the question—*what is a man and what is an ape?* The intensive knowledge which led Prof. DART of Johannesburg, to whom the Taungs skull was handed by Dr. R. B. YOUNG after exhumation in a quarry near the Harts River, to the decision that he had come into possession of the skull of a child, *about 5 years old, and belonging* to the basal ancestry of the human stock is set out; and Sir ARTHUR KEITH's opinion as to the exact place in an infinitely ancient pedigree is also given. The views of these learned men do not coincide, but the clearness of detail and closeness of reasoning associated with the very popular forms of detective fiction are employed in the telling, and, in consonance with this type of narrative we are left, at the stage which the story has reached, with alternative solutions. Prof. DART conceives of the Australopithecus (so he has christened the little person) as owing descent to the main human stem low down in the miocene period; while Sir ARTHUR KEITH, modernising the ancestry by some 200,000 years according to the modified time scale which he employs, would assign descent to the anthropoid stem at the juncture of the miocene with the pliocene period. To put the diverging theories briefly, while Prof. DART considers that Australopithecus derives almost from the point where the human and anthropoid stems would seem to divide, Sir ARTHUR KEITH elevates the child to a place fairly high up the anthropoid stem, on the way to becoming a gorilla or a chimpanzee. Sir ARTHUR KEITH finds the geological evidence not to agree with any attribution of Australopithecus to a miocene date, finding little or nothing to support the view that we have here a representative of a prehuman stage in man's ancestry. We are compelled, he thinks, to attribute the Taungs skull to a geological period when man was already in existence, while the manifestations of certain humanoid characters are merely reminders of a common inheritance of the great anthropoids and man at a period too far behind us for contemplation.

While the Taungs discovery is thus prominently put before us as the chief event of the period dealt with, in the rest of the book it may almost be said that the rest of the world is brought into association with archæological research. We hear of ancient men, and their place in the great pedigree, whose remnants have been unearthed in other parts of Africa, in Palestine, Egypt, China, Spain, Italy, and Russia, in America, Scotland, Ireland, and England, the story ending with the exhumation of the fossil woman reclining in the heart of the City of London, beneath Lloyd's and within a few yards of the Mansion House and London Bridge. *The skull of this skeleton,* which is now in the Museum of University College, London, was examined by Prof. ELLIOT SMITH, and the geological evidence relied upon to confirm its antiquity is given us in great detail. By anatomical analysis the conclusion is reached that the human *skull found under the foundations of* Lloyd's building represents a modification of the Piltdown man, whose period coincides with the pliocene and earliest pleistocene deposits. The assumption is that the London lady had a Piltdown skull, modified through the influences of a long period *of time, and the significance of this theory* is that the objections to placing the Piltdown type in ' direct line of the ancestry of modern man, because of certain simian characters, are felt to be less weighty; evidence is accumulating, as Sir ARTHUR KEITH points out, that structural changes may occur in *groups of humanity long after* their separation from a common ancestor, and that "parallelism" must be accepted as having been a factor in the evolution of human races. So the Piltdown man may turn out to be the ancestor so long searched for; and, with due caution, Sir ARTHUR KEITH takes this view.

THE TUBERCULIN REACTION.

THOUGH tuberculin has been employed fo diagnostic purposes for more than 20 years, nc much of fundamental importance has been a to KOCH's original harvest of discovery, and understanding of the action of tuberculin is far from complete. Knowledge of its chemis is gradually growing. KOCH showed in 1891 by precipitation with alcohol it was possible *concentrate the essential active principle* which when injected into tuberculous animals, pro characteristic symptoms ending in death, the well-known intense congestion of liver, and tuberculous foci seen at autopsy. D the past few years SEIBERT, LONG and M in America, and LAIDLAW and TYTLER, in E have prepared crystalline "tuberculo-protein and the specific "carbohydrate gum." F results obtained with these and Miss SEIBERT latest fractions[1] produced by salt precipitati and hydrolysis, we may conclude broadly that the protein moiety is predominantly associated with "tuberculin," lethal on injection into tuberculous animals, and also causing intrac reactions—though DORSET is of opinion that lethal and the skin-excitant principles are different —while the carbohydrate part is not itself toxic but gives a precipitate in the test-tube with the serum of a tuberculous animal or one injected with large quantities of dead tubercle bacilli. What part is played by the tuberculo-protein or the carbohydrate in the production of the symptoms of tuberculous infection or of immunity after recovery is not yet clear. KOCH showed that an animal, once infected, responded to a second injection of living or dead bacilli by an intense inflammatory reaction. This increased sensitivity of the cells of the infected animal or "allergy" has been considered responsible for most or all of the febrile phenomena of the disease and the various tuberculin reactions. But useful as the expression "allergy" is, it does not here carry us far. We know that the tuberculous animal can be desensitised. The tale runs that the tortuous cattle-dealer will send a man to accompany his prize cattle to South America, with instructions to inject them periodically with tuberculin so that the infected ones will, on arrival, pass the subcutaneous examination with honours. No simple interpretation of this "doping" is to hand. The hypothesis (Giessinger and others) that there is a circulating antibody in the infected animal which causes the subcutaneous or intradermic reaction will not suffice, for we cannot readily demonstrate an antibody by passive transference to other animals. Nor is there any unanimity about "immunity" in tuberculosis. Some state that an adult once positive to skin test remains always positive. Pottenger, on the one hand, believes that the sensitivity of the cells decreases with the healing of the tuberculosis; others hold that it increases.

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[1] New Discoveries Relating to the Antiquity of Man. By Sir Arthur Keith, F.R.S. London: Williams and Norgate, Ltd. 1931. Pp. 512. £1 1s. net.

[1] Seibert, F. B., and Munday, B.: Amer. Rev. Tuberc., 1931, xxiii., 23.

When we compare the views of the veterinary surgeon and the laboratory worker we find a refreshing measure of agreement. Tuberculins made from human and bovine bacilli apparently contain the same tuberculo-protein and carbohydrate, and will equally detect infection with either bacillus; the tuberculin reaction indicates active infection with the tubercle bacillus; the larger the dose used, the earlier after infection can one elicit the tuberculin reaction; in the final stages of the disease tuberculin may produce no reaction. Both groups of inquirers use the subcutaneous method but both favour intradermic injection, veterinarians injecting into the caudal fold—a method which gave satisfaction in some millions of tests in America—or adopting the convenient "repeat" injection of the Douglas-Buxton method favoured in England. There is no satisfactory evidence that workers in the past used tuberculins of comparable potency. The Therapeutic Substances Act now requires a potency equal to that of the International Standard Tuberculin, which is based on the original German standard. Given tuberculin of standard potency, the modern clinician tends to use the intradermic Mantoux test in preference to the von Pirquet, in which the precise amount of tuberculin absorbed cannot be measured, or the subcutaneous test which may cause a severe reaction and activate a dormant lesion. The clinical reports, obtained mainly by the Mantoux test, show considerable agreement, though there are still many gaps in our knowledge. It seems fairly clear that we all commence life with a negative reaction, but most have become positive when adult life is reached—we have passed through the fire of infection and those who have not succumbed have developed a relative immunity. If we are still negative, we cannot face exposure without risk. Heimbeck[2] reports that, though only 208 of 397 hospital nurses showed on entry a negative reaction, this group provided 40 of the 43 cases of tuberculosis which developed during the three years' course in hospital.

Dilutions of one hundred-fold or less are used in the intradermic test, the volume injected being 0·1 c.cm.; possibly thousand-fold will eventually be found the most useful routine dilution. Moncrieff, Schlesinger and D'Arcy Hart, examining London children, found the test of great clinical value, though not infallible. W. F. Gaisford has set out his experience in our own columns recently.[3] A negative test up to about the age of 8 is strong evidence against active infection, while a positive reaction equally strongly indicates it. Most authorities would agree with these workers, but after childhood the light becomes less clear. A convenient figure to remember is that at the age of 7 a positive reaction to a thousand-fold dilution of tuberculin indicates a five-to-one chance that the child has an active infection, while at 14 the chance is about even. Blair and Galland[4] propose to get further evidence by using, at one test, dilutions ranging down to one in ten million, and endeavour to fix a "threshold" dilution for various ages, a reaction to which shall indicate active infection. It is doubtful if our knowledge of to-day is precise enough in every population to make this method of test of decisive value to the clinician. We do know that, in the laboratory animal, as the infection progresses after inoculation of live bacilli, the animal will yield positive reactions to more and more dilute tuberculin. It is reasonable to suppose that a series of quantitative observations on the same tuberculous patients at intervals would show whether the average patient obeys the same law. Cummins and Lobban[5] find that the sensitivity remains high or even increases in tuberculosis running a benign course or going on to permanent quiescence. Many clinicians will feel that here is an opportunity of securing data of value to the perplexed practitioner. Could not some authority such as the Medical Research Council or the British Medical Association use its efficient organisation to coördinate work at present in progress and arrange for a large team research, not forgetting a trained statistician?

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[2] Heimbeck, J.: Norsk Mag. f. Laegevid., 1927, p. 457.

[3] The Lancet, March 7th, p. 521.

[4] Blair, J. E., and Galland, W. I.: Amer. Rev. Tuberc., 1931, xxiii., 1.

[5] Lobban, J. W.: Tubercle, 1930, p. 19.

Royal Sanitary Institute.—The forty-second congress of this institute will be held at Glasgow from July 4th to 11th under the presidency of Sir Henry Mechan. The sectional presidents include Dr. J. Parlane Kinloch (preventive medicine), Dame Louise McIlroy (maternity, child welfare, and school hygiene), Sir David Munro (hygiene in industry), and Dr. J. R. Currie (conference of medical officers of health). On July 10th Major Walter Elliot, M.P., will deliver the congress lecture on A Continuous Health Policy, and on the following day there will be excursions by steamer or motor in the neighbourhood. The offices of the Institute are at 90, Buckingham Palace-road, London, S.W.1.

ANNOTATIONS

MYOCARDIAL DISTRESS.

THE problem of the underlying cause of angina pectoris has long puzzled both clinical observers and pathologists, the two most popular views being those championed by James Mackenzie and Clifford Allbutt. The former regarded angina as an indication of myocardial exhaustion, while the latter found its origin in a lesion of the aorta. Mackenzie's view received encouragement from the clinical recognition of the syndrome of coronary thrombosis; here was a disease with a clear-cut pathological picture, associated with severe anginal pain. The pain may differ in the length of its duration and in its severity from that of angina pectoris, but its site, character, and associated phenomena are identical. Recently Parkinson and Bedford[1] brought forward important evidence that the pain of angina, like the pain of infarction, is due to ischæmia of cardiac muscle, and work on similar lines is now reported by Wood, Wolferth, and Livezey.[2] In the cases of angina pectoris studied the attack was induced by exertion, but the possible influence of this on the electrocardiogram was excluded by controls. Half the patients showed —as in Parkinson and Bedford's five cases—changes in the ventricular complex of their electrocardiograms during the attack and these changes disappeared after the pain had passed off. Admittedly every case did not show this phenomenon, nor was there any correlation between the severity of the attack and the amount of alteration of the electrocardiogram; moreover, cases of coronary thrombosis have been reported which showed no electrocardiographic changes and others which suffered no anginal pain. To test their theory further, Wood and his colleagues investigated the effect on the electrocardiogram of cats and dogs of a temporary occlusion of part of the coronary circulation. They found that by this means they were able to produce changes in the electrocardiograms very similar to those observed in patients during an attack of angina pectoris. These changes did not invariably follow the occlusion of part of the coronary circulation and seemed to depend largely on the artery selected, the duration of the occlusion, and the amount of trauma which the heart had previously suffered. They made it clear however that changes in the electrocardiogram may appear and disappear within two minutes and that it is possible for the heart to recover and the electrocardiogram to return to its previous state after temporary myocardial ischæmia sufficient to produce electrocardiographic changes. From another point of view the coronary theory has recently received support from the investigations of Hyman and Parsonnet,[3] who have coined the word "myocardosis" to differentiate the changes in the myocardium consequent upon vascular failure from true inflammatory lesions. In a review of the early evidence of this condition they find that such evidence is mainly subjective in character and that the most important symptom is præcordial distress on exertion. This is described as a sensation of tightness and would appear closely to approximate to a mild attack of angina. Thus from two aspects we find evidence pointing to the view that true anginal pain is an indication of myocardial distress.

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[1] Parkinson, J., and Bedford, D. E.: THE LANCET, Jan. 3rd, p. 15.

[2] Wood, F. C., Wolferth, C. C., and Livezey, M. M.: Arch. Int. Med., 1931, xlvii., 339.

[3] Hyman, A. S., and Parsonnet, A. E.: New Eng. Jour. Med., 1931, cciv., 648.

THE REGENERATION OF PERIPHERAL NERVES.

A CONTROVERSY, amounting sometimes to an acrimonious dispute, has for the last 60 or 70 years ranged round the problem of the mechanism of regeneration of peripheral nerves. Although the work of Ramon y Cajal seemed finally to establish the monocellular theory or theory of continuity, there remain some signs of doubt, and J. A. Hannah,[1] in a recent paper, tells us that some modern writers imply that the monocellular view has not yet been satisfactorily substantiated. All are agreed that, when a nerve cord is cut across, the peripheral portion degenerates whilst the central portion remains unchanged, or, at most, suffers only local traumatic damage; and further, that the peripheral portion can regenerate with the reappearance in it of new axis cylinders. The question at issue is how this regeneration is accomplished. There have been two opposing theories: the monocellular theory, or the theory of continuity, according to which the new axons are considered to be outgrowths of nerve-fibres from the central stump, thus being direct continuations of the central neurones; and the polygenist, or catenary theory, according to which the new axon is supposed to arise through a special differentiation of the cells of Schwann in the severed nerve trunk, and thus to be built up from a chain of independent centres the links of which chain ultimately unite to form the nerve-fibre. Waller adopted the former view, and his conception of "trophic centres" rests on the assumption that it is true. Remak, Ranvier, Vanlair, Ziegler, Stroebe, and many others have done likewise, and have demonstrated the sprouting of nerve-fibres from the central stump, and the extension of the sprouts into the peripheral cord. The opposition was founded in 1859 by Philipeaux and Vulpian, who devised experiments in which the central stump of a cut nerve was so far displaced that to bridge the gap between the severed ends seemed impossible. They concluded that the new axons which nevertheless did appear after a time in the peripheral trunk were local autogenous products. Bethe repeated their experiments and supported their conclusions. Büngner, in histological investigations, detected in the cells of Schwann, which incidentally undergo proliferative activity in the severed nerve cord, a longitudinal striation which he interpreted as "an intraprotoplasmic differentiation" directed towards the new formation of nerve-fibres. This polycellular theory, with its supposed chain of independent centres of development, struck at the roots of the Wallerian doctrine, but it has nevertheless remained a powerful influence almost to the present day.

Cajal, Perroncito, and later workers entered the field with improved weapons. Silver impregnation of nerve-fibres renders them more easily demonstrated than did the older methods of investigation, and these workers have been able to trace more certainly the steps of the process of regeneration. Cajal has shown that the sprouts from the central stump form a plexus of fibres, many of which are attracted to the peripheral trunk, enter it, and extend along it. The part played by the cells of Schwann is not to form new fibres, but to elaborate a substance which attracts the young fibres to the peripheral cord, and also to form a support for them when they enter the cord. He showed, moreover, that continuity can be established between the severed ends in spite of wide separation. Hannah, using Cajal's methods, has lately carried out experiments with partial cutting through the nerve trunk, so that the ends remain approximately in apposition. He was able to follow closely the process of establishment of continuity and, in the main, to confirm once more Cajal's findings and the theory of continuity. Only in a minor point regarding the histogenesis of certain phagocytic cells concerned in the degeneration process in the peripheral trunk did he disagree with Cajal. Thus the theory of continuity would seem to hold ground still more firmly, and we hope with Cajal[2] "that new investigators, instead of attacking incontestible principles . . . will discard polemics and devote themselves to the enlargement of our knowledge."

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[1] Edin. Med. Jour., 1931, xxxviii. (New Series), 73.

THE WRITINGS OF DR. HUGHLINGS JACKSON.

ALL physicians—even if neurologists more particularly—will be interested in learning that the collected writings of Hughlings Jackson are about to be published in two volumes, edited by Dr. James Taylor with whom are associated Dr. Gordon Holmes and Dr. F. M. R. Walshe. It has been said of Jackson that he was "the deepest thinker in neuropathology of the nineteenth century," and the justice of this tribute is to be seen in the wide and still spreading influence that is exerted by his fundamental conceptions of nervous activity. Not only did he enrich neurology with clinical observations of the first importance, but he brought to the interpretation of these a penetrating scientific imagination. The generalisations he formulated have stood the test of many years of clinical application, and have received striking confirmation at the hands of Sir Charles Sherrington and other masters of the experimental method. Unfortunately, many of Jackson's papers appeared so long ago that they are inaccessible to modern readers and their republication by Messrs. Hodder and Stoughton is timely. The first volume, which will appear in the course of a few weeks, contains the papers dealing especially with epilepsy and epileptiform convulsions, a subject which early enlisted Jackson's interest, and with which his name will always be associated. The second volume, which it is proposed to issue after a very short interval, will contain a selection of lectures and addresses and the principal papers in which Jackson expounded his views on the evolution and dissolution of the nervous system.

COLDS AND ULTRA-VIOLET LIGHT.

THE unfortunate sufferer from colds in the head is always having his hopes raised and dashed. At one time he pinned his faith to vaccines; later he thought that ultra-violet irradiation might make his winter as cold-free as his summer. Various contradictory experiments have been recorded; the latest is a depressing one. J. A. Doull, M. Hardy, J. Clark, and N. B. Herman[3] have irradiated 179 medical students and students and staff of a School of Hygiene, the subjects of experiment being selected at random from among 363 volunteers of whom the rest formed a control group. The lamps were tested alternate weeks by the zinc sulphide method to ensure accurate measurement of dosage, and the amount given was sufficient to produce a minimal erythema. The volunteers stripped to the waist and one unit of treatment was given to the back; if an erythema occurred the dose was repeated next time, but if not the dosage was increased by half a unit. When six units were reached the irradiation was applied to the front instead of to the back and the cycle was repeated. Some were exposed once a week and some twice a week. Volunteers were interrogated about their nasal state at least three times a week. The results were disappointing for the advocates of sunlight. From September to May the irradiated had a slightly higher incidence of nasal catarrh than the controls, although an approximately equal number—42 per cent.—in each group had given a history of four or more colds per annum before the experiment. During the period of 35 weeks there were 930 attacks of acute upper respiratory disease, 460 among the irradiated, and at no time during the period did the attack-rates show any appreciable advantage to the treated. Nor was there any significant difference between the volunteers who received two treatments a week and those who attended only once. Sensitiveness to ultra-violet light did not seem to be related to susceptibility to colds. The severity of the colds was not greatly affected. Five standards were selected: absence from work on two days and confinement to bed on one or more days; fever on the first or second day; later fever; productive cough; and duration of illness. The groups showed no difference except in the incidence of secondary fever, where the irradiated seemed to be luckier, but the difference was not great enough to be significant.

OXIDATION-REDUCTION POTENTIALS.

THE oxidation-reduction potential (Eh) bears the same relation to oxidation as hydrogen-ion concentration (pH) does to acidity. Research on this subject is therefore of the greatest interest in biology, and we are glad to see from Dr. Hewitt's monograph[1] that British scientists are taking a prominent part in it. The pioneer experiments in this field were made with dyes such as methylene-blue and were commenced by Ehrlich in 1880, but there are many disadvantages to this method, and the platinum electrode is a more trustworthy instrument. It is probably owing to the lack of electrometric measurements that so little advance was made in the past. Dyes will still be useful for special purposes (such as the Schardinger test for milk) but are unsuitable for exploring unknown fields. Most of the positive results have been obtained in bacteriology, where the relative simplicity of the organisms and media offers assistance to the control of oxidising conditions; the measurement of Eh has, for instance, thrown much light on the difference between aerobes and anaerobes. Owing largely to the work of Fildes and of Hewitt it appears probable that they may be distinguished by the levels at which they are able to proliferate. Aerobes are able to produce a certain reduction intensity and to multiply at a level which is too high for anaerobes; anaerobes are powerless in aerobic media but at a lower level, attained by exclusion of air, they can multiply and finally produce a much lower Eh than the aerobes. Another classification based on the peroxide-forming power of bacteria has been proposed by J. W. McLeod. According to this theory anaerobes perish in air

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[2] Cajal: Degeneration and Regeneration of Peripheral Nerves (Transl. R. M. May). Oxford Univ. Press. 1928.

[3] Amer. Jour. Hyg., March, 1931, p. 460.

[1] Oxidation-reduction Potentials in Bacteriology and Biochemistry. By L. F. Hewitt, Ph.D. Published by the London County Council, 1931.

Committee for Youth, to leaders of voluntary organisations and to young people between the ages of 16 and 20. This work has brought to light the need for direct teaching on preparation for marriage and the management of married life. A special committee has accordingly been considering what type of information should be in the hands of "leaders of the community," and an experimental course of lectures is to be given by members of this committee to audiences composed of people engaged in religious, medical, and educational work. The audiences will act as consultative committees, participating actively in the discussion after each lecture, and the objective of the course is to produce a handbook for leaders. Dr. A. H. Harkness, the hon. medical secretary of the Council, asks us to say that a cordial invitation is extended to medical men and women to attend the lectures and offer advice and suggestions. They will be delivered at Carteret House, Carteret-street, Westminster, S.W. at 5.30 P.M. on Tuesdays from May 5th to June 9th, and the speakers will be Prof. B. Malinowski, Dr. H. Crichton-Miller, Dr. I. Feldman, and Mr. Z. F. Willis. Full particulars may be had from the secretary at that address.

MARGARET McMILLAN.

THE name of Margaret McMillan will long be honoured because of her untiring devotion to the welfare of children. It was in Bradford that she and her sister Rachel first gained the knowledge of elementary schools which made them dedicate their strength and gifts to this service. "What we saw there," she said, "will perhaps never be seen again. Happily it could not be seen now, when medical inspection and school clinics have become commonplaces of our life. Children in every stage of illness. Children with adenoids. Children with curvature. Children in every stage of neglect and dirt and suffering." The parents of these children took for granted conditions of child life and labour now thought of with horror, but by degrees they acquired a new point of view, and under Miss McMillan's inspiration the Bradford school board went boldly forward. In 1902 she and her sister came to London, and, with the help of Sir Victor Horsley, agitated to obtain legislation for the expenditure of public money on medical treatment for elementary school-children. In 1906 she headed a deputation to the Board of Education, which secured the Act of Parliament making medical inspection of school-children a duty of local education authorities. In 1908 the two sisters opened a school clinic in Bow, but it did not prove successful. Undaunted by failure, they started a similar centre in Deptford in 1910, and from the first children "came in torrents." In a single year thousands were treated for adenoids and dental troubles, and the success of the clinic was so apparent that in 1911 a State grant was given for dental service, and in 1912 for medical treatment. A garden in Deptford was turned into a camp, which after being used by day became an open-air dormitory at night. But what the McMillans were doing was remedial, and what they longed to do was preventive. Accordingly in 1914, the now famous open-air school at Deptford, the first of its kind in this country, was opened. Deptford was chosen for its extreme poverty, and the amazing success of the school suggests that similar results could be got anywhere. The war brought tragedy and disaster to Deptford, and in 1917 Rachel died, worn out by grief and hard work. From that time Margaret McMillan gave her life to the task of procuring a chance of full physical, mental, and spiritual development to every child. She was the advocate of school meals for necessitous children, nursery schools, open-air schools, and playgrounds, all of which in some measure she lived to see in being. If she was visionary she was also practical. She was the kind of idealist whose ideals come to be accepted as common sense and thereby gain official recognition and public grants. In a life of striving, she broke down many barriers which might have long stood fast if she had failed in courage. She died on March 29th at the age of 70.

THE AMERICAN JOURNAL OF CANCER.

THE *American Journal of Cancer*, of which the first two numbers have just appeared, is the old *Journal of Cancer Research* writ large. It appears in the same cover and format and the number of the volume continues that of its parent publication, but each issue has about 600 pages where its predecessor offered 150. A valuable new feature is the critical abstracts of the current cancer publications appearing over the names of a staff of experts on different aspects of the subject. It would perhaps be best if all these abstracts were signed, and since they deal with many hundreds of papers and occupy about half of each issue, the addition of a subject index is desirable. The other half of the journal is reserved for original contributions, and these are no longer confined to papers on cancer research in the more restricted sense. They now refer to all phases of cancer—experimental, clinical, statistical, and educational—and the editors have cast their net so widely as sometimes to catch contributions which have no very clear bearing on the problem. The papers are lavishly illustrated and the figures are of exceptional excellence. Special attention may be drawn to the remarkably clear microphotographs of mitoses magnified 2500 times which accompany a paper on the Cytology of Cancer by Michael Levine. The journal, which like its parent is edited by Prof. Francis Carter Wood, is now the official organ of the American Society for the Control of Cancer and of the American Association for Cancer Research.

As we have already announced, the Eighth British Congress of Obstetrics and Gynæcology meets on Wednesday next at Glasgow. The sessions will be held in the Lister memorial hall at the Royal Infirmary, and the meeting will end on Friday.

Summer Time will commence in Great Britain, Ireland, the Channel Islands, and the Isle of Man on Sunday morning next, April 19th, at 2 A.M., when the hands of timepieces should be advanced one hour. It will end on Sunday, Oct. 4th.

SOCIETY FOR RELIEF OF WIDOWS AND ORPHANS OF MEDICAL MEN.—At a quarterly court of directors held on April 8th, Mr. V. Warren Low, President, in the chair, it was reported that an annuitant of the society, who came on the funds in 1887, died last January. Her husband was elected a member in 1875 and paid in subscriptions £25 4*s*. His widow received in grants £3300. A first application for relief was received from the widow of a member and a yearly grant of £75 was voted, not including the Christmas present, the amount of which depends on the money available for distribution at the end of the year. A sum of £91 5*s*. was voted to widows as special grants to enable them to continue the education of their children who had reached the age of 16, at which age the ordinary grants from the society cease. A donation of £101 12*s*. 6*d*. from the Bovril Medical Agency was reported. Membership to the society is open to any registered medical man who at the time of his election is resident within a 20-mile radius of Charing Cross. Full particulars from the Secretary at 11, Chandos-street, Cavendish-square, London W.1.

SPECIAL ARTICLES

A SURVEY OF THE IMMUNISATION OF CATTLE AGAINST TUBERCULOSIS.

(C) Living Bovine Vaccines.*

The third group comprises vaccines of living bacilli of bovine strains.

The bulk of this work has been done by Calmette and his co-workers with the well-known strain of attenuated bovine bacillus—B C G. *Chaussinand* [1] has recently brought together most of the work and the present writer is indebted to his book for much of the summary which follows.

In 1906 Calmette and Guérin stated that if cattle were given one dose of virulent tubercle bacilli by the mouth the resulting tuberculosis would sometimes heal. The vaccination produced in this way conferred on the animals a definite degree of resistance to fresh infection at a later date. The immunity was not complete, however, and if the doses of infecting bacilli were repeated tuberculosis resulted. After a series of tests with a tubercle strain of equine origin the writers isolated a bovine strain which they cultivated on a medium of potato heated with pure ox bile with 5 per cent. glycerin, the cultures being kept at a temperature of 30° C. in an excess of bile. By repeated subcultures this strain lost its virulence for the ox, the ape, and for the ordinary rodents used in laboratory work.[2] The strain was originally lethal to young cattle when injected intravenously in 3 mg. doses, but after 30 subcultures its virulence had been reduced so that a smaller dose could be tolerated. At this stage Calmette injected intravenously eight heifers with doses of 1 mg. and 5 mg. of B C G at an interval of one month. Thirty days after the second injection the animals were given, intravenously, 3 mg. of virulent tubercle bacilli, a ninth animal of the same age and herd being given the same dose at the same time as a control. The control animal showed the usual clinical picture; at the end of the sixteenth day there was sudden hyperpyrexia which persisted up to the time of death. None of the vaccinated heifers showed any hyperpyrexia, and all remained perfectly well. Seven of the animals were killed one, two, three, four, eight, 12, and 18 months respectively after the beginning of the experiment, and, at the autopsies, no trace of tuberculosis was discovered. The bronchial lymphatics of each animal, however, when ground up and injected into guinea-pigs produced tuberculosis.

During the years 1912 to 1915 Calmette repeated the experiment on ten heifers. Six of them were given, intravenously, on one occasion 20 mg. of attenuated bacilli of bovine origin and four were kept as controls. Calmette stalled them with infected cows in a stable which was arranged so as to be specially suitable for natural infection to take place. Three of the vaccinated heifers were revaccinated intravenously with a dose of 20 mg. one year later, two of these receiving a further injection of 20 mg. after another 12 months. Thirty-two months after three of the controls were proved, at autopsy, to have pulmonary and lymphatic tuberculous lesions, whilst the fourth control remained free. Of the three heifers which were not revaccinated two showed at autopsy small tubercles in the lungs and the bronchial, mediastinal, and mesenteric glands, and the third showed no lesions as proved by inoculation into a guinea-pig. The heifer vaccinated twice and the two vaccinated three times showed no lesions at autopsy, and guinea-pig tests were negative.

Calmette next vaccinated 12 heifers, aged from 7 to 8 months, subcutaneously. In this case he decided to use stronger doses. Six heifers were given 100 mg. of vaccine and the other six 50 mg. Eight heifers of the same age were used as controls. Into all these animals he injected a resistance test dose of 5 mg. of virulent bovine bacilli. The results were as follows: six of the controls died, between the thirty-second and the fifty-eighth days, of massive or acute miliary tuberculosis; the other two were killed after 60 days and showed miliary tuberculosis of the lungs. On the other hand, 11 of the 12 vaccinated animals showed no naked-eye tuberculous lesions at autopsy made from two to twelve months after inoculation, although the glands of seven of them proved infective to guinea-pigs. In the twelfth heifer, vaccinated with only 50 mg., sclerotic lesions without visible tuberculosis resulted.

From these experiments Calmette deduced that the duration of immunity bore a definite relationship to the size of the dose of B C G vaccine.

From 1921 to 1926 Guérin, Richart, and Boissiere performed some experiments in Gurville (Seine-Inferieure) where tuberculosis infection persisted in spite of all hygienic measures employed. The calves were vaccinated at birth with a dose of 1 to 2 mg., intravenously, up to 1923, and after that time subcutaneously with a dose of 50 mg. All the animals were revaccinated each year. In 1927 the results were as follows: In the cattle-sheds at Gurville there were 58 cows and heifers, vaccinated and revaccinated, who were quite well. Twenty-five oxen and five cows, born and reared in that infected environment, were slaughtered and showed no lesions. Of these 30 cattle 16 were born of tuberculous mothers and 13 of suspected mothers, and all were fed for the first month on raw milk from the mother. During the experiments all isolation and disinfection measures were suspended.

Meanwhile Guérin investigated the date of the appearance of immunity after vaccination with B C G in cattle. He showed that immunity was still incomplete on the tenth day but became complete about the twentieth day. In France 49 veterinary surgeons who had vaccinated 2315 cattle replied to a questionaire sent out by Guérin. From these replies Guérin found that 103 animals had died from causes other than tuberculosis and 121 had been sent to slaughter. At autopsy true tuberculous lesions were shown in eight cases, whilst 113 showed no lesions. All these animals had been born in infected sheds and had remained there without any of the precautions having been observed.

Ascoli and his collaborators vaccinated, up to 1927, 2414 young cattle subcutaneously. None of the vaccinated animals which had been killed or had died showed tuberculous lesions. De Assis and Dupont immunised, between 1926 and 1928, 64 cattle which had not been isolated after vaccination and which had not been fed on sterilised milk. These authors record three autopsies—two on vaccinated animals and one on a control. The two vaccinated animals killed at the age of 20 months showed no tuberculous lesions. On the other hand, the control, having lived under the same conditions as the other two and being killed at the age of 16 months, showed caseous tuberculosis of the left parietal pleura, as well as a number of tuberculous nodules on the visceral pleura, and glandular lesions. The authors emphasised the need for isolation during the month following the vaccination, and for feeding, during this time, with milk free from virulent bacilli. Gerlach vaccinated and revaccinated, for three years, 373 calves living in an infected environment and failed to discover any trace of tuberculosis. Lignières obtained a very marked resistance against natural infection in cattle vaccinated with 50 mg. B C G subcutaneously compared with non-vaccinated controls, but found that this resistance often decreased very rapidly. Maya vaccinated 874 calves from July, 1927, to December, 1928, and reported satisfactory results (details not given by Chaussinand). Mello, after various experiments on 22 calves, concluded that 50 mg. B C G, given immediately after birth, produced in the animals absolute resistance, one month afterwards, to a resistance test of small doses of virulent bacilli. On the other hand, large doses of virulent bacilli always gave rise to serious lesions even among the vaccinated. In this case, however, the lesions were less widespread and the survival longer than in non-vaccinated animals. He also noted that the immunity appeared from 20 to 25 days after vaccination.

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* Sections (A) Dead Vaccines, and (B) Living Non-Bovine Vaccines appeared last week.

Obukhovski obtained the following results. Six cows vaccinated subcutaneously (100 mg.) remained in good health in spite of an intravenous resistance test dose of known virulence. Four to seven and a half months later one animal showed a tuberculous induration of the right lung, four others an engorgement of the mediastinal glands, and the last no sign of tuberculosis. On the other hand, the seven control animals, infected in the same way, were found clinically to be tuberculous, and at autopsy, two to seven months after infection, showed progressive tuberculosis of the lungs and the bronchial glands. Four cattle, vaccinated in the same way as the above, received 16 to 18 months later an intravenous resistance test dose of 10 mg. of virulent bacilli. A control and one of the vaccinated animals died, after 25 and 27 days respectively, of miliary tuberculosis. The three other vaccinated animals were still in good health four months after the virulent inoculation.

Rankin treated 25 calves with a subcutaneous injection of 60 mg. B C G. One year later these animals were given an intravenous resistance test injection of 5 mg. of virulent bacilli. Of the controls 95 per cent. presented gross tuberculous lesions; of the vaccinated animals only one died of generalised tuberculosis, the remaining 24 showing healed lesions or none. In the course of another experiment Rankin vaccinated 25 cattle with 50 mg. B C G. These animals were placed in contact with tuberculous animals for eight months, during which time they were fed on milk from tuberculous animals. At autopsy it was found that 32 per cent. of the vaccinated animals showed slight non-progressive tuberculous lesions, and the remainder no lesions. Of the controls 72 per cent. showed tuberculous lesions, mainly caseous and progressive. Tzekhnovitzer vaccinated subcutaneously 13 calves with a dose of 86 to 300 mg. B C G, followed seven to eight months later by a resistance test dose of 5 mg. of bovine bacilli. Four control heifers died of miliary tuberculosis, and all the vaccinated animals, with one exception, lived, but no subsequent autopsy records are quoted. Chaussinand quotes Forsner, Jundell and Magnusson as having obtained less conclusive results, but he considers that their experiments were performed under unsatisfactory conditions. Some of the vaccinated animals, for example, had been in contact with tuberculous animals before the experiment began and had not given a tuberculin test before vaccination.

In 1928 the Health Committee of the League of Nations authorised the President to convene a meeting of a few experts to examine the results of vaccination with B C G against tuberculosis.[3] Three commissions were formed—bacteriological, clinical, and veterinary. The Veterinary Commission reported as follows: (1) The experimental facts published and the unanimous opinion of practitioners who have used B C G in cattle justify the conclusions that vaccination carried out according to the technique of Calmette and Guérin, among bovines, is a perfectly harmless procedure; (2) similar experimental data and published observations with regard to the use of B C G among bovines demonstrate that this strain of bacteria confers definite immunity against both experimental and natural tuberculosis infection. These recognised "pre-immunising" (prémunisantes) qualities justify and encourage the extension of the experimental use of B C G in the prevention of bovine tuberculosis. There were no British participants in this Paris conference.

At the Eleventh International Veterinary Congress held in London in 1930, Watson gave, up to date, the results of experiments which he and his co-workers had been making for the past five years under the Canadian Government.[4] One set of calves used was from a tuberculous herd and the other from an accredited tuberculosis-free herd. The usual precautions were taken as to segregation, feeding, tuberculin testing, &c. Two vaccines were used—viz., B C G and one made from a moderately virulent strain of tubercle bacillus, with an unvaccinated group as a control, making three groups in all. After vaccination of the first two groups, all three groups were put to proof by one or other of the following methods: (1) resistance test dose of virulent tubercle bacilli by inoculation; (2) resistance test dose by ingestion; (3) natural exposure to tuberculosis under ordinary farm conditions. The tests extended in all up to four and a half years. Autopsies on 72 cattle showed tubercle in 78 per cent. of cattle vaccinated with B C G, in 90 per cent. of [illegible] vaccinated with virulent bovine tubercle bacilli, and in 75 per cent. of unvaccinated controls.

In trials of short duration B C G appeared possibly to retard the development of infection, but this seemed to be more or less transient, and in spite of revaccinations it diminished with time and as the cattle continued under exposure to natural infection. It was finally considered that B C G was contraindicated as a means of controlling bovine tuberculosis in Canada where drastic measures of destruction of the sources of infection were possible.

Buxton and Griffith,[5] in a preliminary report in these columns a few weeks ago, recorded the results of tests on 51 calves vaccinated with B C G by various methods—viz., 10 by feeding, 4 intratracheally, 3 peritoneally, and 34 intravenously. These calves were subsequently tested as to their resistance to tuberculosis together with 14 untreated calves by the intravenous inoculation of very virulent bovine tubercle bacilli in doses from 1 to 0·25 mg. of culture. They found that the strain of B C G with which they were working was avirulent for the normal calf and incapable of giving rise to progressive tuberculosis even when inoculated intravenously in large doses. The strain was capable of raising the resistance of a calf to a subsequent virulent experimental resistance test infection. This increase of resistance was less certain after feeding with B C G than after intravenous inoculation, and in the authors' experience intravenous inoculation was the most satisfactory method of giving the vaccine. The degree of increased resistance conferred upon calves by this last method varied within wide limits and appeared in general to be directly proportionate to the dose of B C G vaccine. These experiments are being continued. One of the calves tested by these authors is of particular interest—viz., calf 3. In this calf a high degree of resistance had been induced by feeding it with B C G. The calf grew into a fine heifer, and two years after the test gave birth to a heifer calf which is alive and does not react to tuberculin, although the calf was reared entirely on the milk of its mother.

(D) Vaccines of Uncertain Nature.

The fourth group comprises vaccines the precise nature of which has not been divulged.

From time to time methods of immunisation against tuberculosis are introduced in which the methods of preparation of the vaccine used are not disclosed. Probably the best known of these is the vaccine introduced by Mr. H. Spahlinger in 1913. In 1926 Lovell [6] quoted a preliminary report on the vaccination of cattle against tuberculosis compiled from notes by Wansbrough Jones and Watts. In 1916 some 20 cows were chosen and immunised by the vaccine prepared by Spahlinger. The vaccine consists of "potent and virulent strains of tubercle bacilli," and was administered for six months in gradually increasing doses, after which the cows were rested for six months. At the end of this period they were given a resistance test dose of living tubercle bacilli in varying quantities and of different degrees of virulence, but all of these strains were known to be virulent to animals. No ill-effects were noted. In 1918 some of these cows (numbers not stated) were killed and post-mortem examination made without tubercle being discovered. At the time of the report the remaining cows appeared to be quite well. At yearly intervals one cow was being slaughtered and examined, and no tuberculous lesion of any kind had yet been found. No further details were given.

At the end of last year a report [7] was issued on a further experiment by Mr. Spahlinger on the vaccination of cattle. The vaccine employed on this occasion is of different manufacture from that previously used and is said to be prepared from dead germs, but no further details are given. The injections varied in quantity from "a mere trace to large doses." Six months after vaccination all the calves were given resistance tests of massive doses of living bovine tubercle bacilli, and all except one of the calves was reported to be alive and in good health 19 weeks later. Four control calves, given the same resistance test dose, had died within eight weeks of tuberculosis.

Conclusions.

Reading the records now it is obvious that many of the early experiments on the immunisation of cattle were carried out under unsatisfactory experimental conditions, and the criteria adopted were so different that a comparison of the results is often quite impossible. It seems clear that immunisation by means of tuberculin, bacillary products, or dead bacilli can only be maintained for a short time (probably only a few months), and even then the results are uncertain. Similarly vaccination with strains of tubercle bacilli from cold-blooded animals have not shown results sufficiently good to encourage further tests. The vaccination tests made early this century with living tubercle bacilli of human strains at first seemed hopeful, but the recovery of the bacilli in the milk at a subsequent date when the heifers calved destroyed the hope of successful vaccination by this means. As pointed out by McFadyean at the time, this objection would probably not apply to the same degree with vaccines of living avian bacilli, but the few results recorded have not been followed up. As shown in the preliminary note of Buxton and Griffith recently published in our columns, and in most of the evidence quoted above, the new method of Calmette of using a vaccine of a modified living bovine strain (B C G) looks at the moment more hopeful, though here again the extensive tests of Watson in Canada have been decidedly unfavourable.

Whether the results are going to be vitiated, as in the earlier immunisation work, by the subsequent appearance of living bacilli in the milk of the vaccinated animals it is too early to say. Meanwhile a fresh factor has arisen in the liability of B C G to revert to a virulent state when grown on media other than the original glycerinated ox-bile-potato. These untoward results have been obtained on small laboratory animals and, as far as we know, have not yet been encountered in cattle. Here again it is too early to come to any definite conclusion.

In conclusion it may be useful to summarise Calmette and Guérin's own recommendations for the vaccination of calves. They appear to prefer the subcutaneous route, vaccinating during the first 15 days and revaccinating each year, care being taken that the animals are excluded from infection for one month after vaccination. By careful attention to these details the authors believe that it is possible to eradicate tuberculosis from an infected herd in a period of five years.

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MEDICINE AND THE LAW.

Coroner and Post-mortem Examination.

A MEDICAL practitioner directed by a coroner to undertake a post-mortem examination *should* be careful to understand and comply with his instructions. At Eltham last month a young sapper of the Royal Engineers, stationed at Woolwich, was run over by a motor-car and killed. A house physician, who was directed to conduct the post-mortem examination, stated at the inquest that he found extensive head injuries and a fractured right thigh. The coroner for South-East London reprehended the witness for not having made the full examination of lungs, heart, and other organs, which he had been subpœnaed to undertake. Asked by the coroner why he had failed to make the examination as ordered, the house physician said he found such injuries to the head that nobody could have lived with them; the deceased, a young soldier of 24, did not look the kind of man who would drop dead from heart disease. The coroner rejoined that a doctor should be the last person to say that heart disease might not be present merely because of the patient's appearance. He directed a pathologist to make a fresh post-mortem examination, and he withheld, it seems, the fee for the previous examination.

Criminal Abortion and Professional Secrecy.

The Chief Constable of South Shields states that criminal abortion is prevalent in his district, and complains that he receives inadequate aid from the medical profession in bringing offenders to justice. His annual report, recently made public, contains the following announcement: "It is my intention to institute inquiries into all cases which come to the notice of the police with a view to prosecutions being taken." Nobody will quarrel with this proposal to do his duty. "The medical profession," he adds, "are not helpful in this connexion, the attitude taken up being that it would be a breach of professional confidence to divulge information obtained from a patient. I am of opinion, however, that, notwithstanding this attitude, when crime of such seriousness is known to have been committed, it is the duty of everyone to assist in bringing the wrongdoer to justice."

Nothing that the Chief Constable can say or do will alter the confidential position of the medical practitioner. The doctor preserves secrecy not in his own interests but in the interests of his patient. The medical profession has no particular sympathy with criminal abortion; but its members are neither detective officers nor constables. Their primary duty, if some unfortunate woman, the victim of an illegal operation, seeks their help in desperate need, is to save life and heal the patient, not to terrify or harass her with cross-examination for the purposes of prosecution. If the doctor is to act as a policeman, his questions would have to be subject to the same limitations and formal warnings as those of the police force. Casuistical situations can be imagined in which, according to the dicta of learned judges, a medical practitioner owes a stronger duty to the State as a citizen to reveal his knowledge of a crime than he owes to the patient to preserve secrets confided with the knowledge that they will not be revealed. When these situations arise, the doctor will know where his duty lies.

The police force is naturally sensitive to any suggestion of undetected crime. Such suggestions are not uncommon. The public exhibits occasional uneasiness over the statistics of murders unpunished. Many householders have cause to be aware of the ineffectiveness of the police in checking or apprehending burglars. The annual statistics of criminal abortion, published by the Home Office for England and Wales,[1] and by the Scottish Office for Scotland produce an uncomfortable impression that the law is feebly enforced. The dilemma of the police is inevitable. The policeman's instructions forbid him to wring information from suspected persons except within strict limits. In the case of many offences prosecutions are made to succeed by using the methods of the agent provocateur. To entrap a fortune-teller, for instance, and to provide evidence for a prosecution, a policeman or a policeman's wife can be sent in some kind of disguise to consult the person to be charged. In cases of criminal abortion this course is not so easy. It is a crime in which suspicion is p[illegible] and proof notoriously scarce. It is not co[illegible] in the presence of witnesses; medical evidence [illegible] always be positive; the woman who has su[illegible] to an illegal operation has strong reasons for avoiding publicity; her death, while freeing the medical practitioner from his full duty of secrecy, removes the principal witness for the prosecution. If the Chief Constable for South Shields will prosecute in every suspicious case, the publicity may have its effect in identifying and possibly punishing the local performer of illegal operations. Those who advise the police will know the need of distinguishing between a nefarious and criminal act and the lawful and proper practice of surgery.

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[1] See THE LANCET, 1930, ii., 30.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

HEALTH INSURANCE.

MANY rumours are rife as to proposed changes in the National Health Insurance system at present working in the Irish Free State, although no pronouncement on the nature of these changes has been made by the Government. At the annual congress of the Irish Distributive Workers and Clerks held last week, Mr. Duffy, the secretary, referred to a proposal to cut down the number of approved societies to eight. At present there are 65, and it is admitted that administration by so large a number leads towards inefficiency and unnecessary expense. Mr. Duffy asked his congress to express the opinion that the only satisfactory alternative scheme to the present would be direct administration by the State. He failed to convince his hearers, however, and his resolution was defeated. The argument used against him was that the State had failed to administer unemployment insurance satisfactorily, and that the workers suffered thereby. The members of [illegible] congress do not appear to have considered the disadvantages of giving a monopoly to a few selected approved societies.

Apart from the question of administration [illegible] ordinary benefits, it is rumoured that the Government has in view the establishment of a medical benefit in the large towns, to be administered by a panel scheme. The pressure to establish a medical benefit has, [illegible] course, become stronger since the Government [illegible] Northern Ireland has taken this step. It is doubtful, however, whether it is wise to proceed to the task in piecemeal fashion. It is agreed on all hands that panel scheme is unsuitable to the country at large but the discussion of general policy would be hampered if the Government were to tie themselves in advance to a panel scheme for the towns. If the Government were in the first instance to decide on making a State Medical Service a basis for the whole scheme, then the necessary modifications for the towns could be arranged easily enough.

COUNTY MEDICAL OFFICERS OF HEALTH.

The Department of Local Government and Public Health continues to press the dilatory county councils to proceed to the appointment of county medical officers of health. In most cases it has been necessary for the department to fix the salary and conditions of service, and unfortunately in some instances the department has consented to a salary which will hardly attract the best candidates. The case of County Dublin is the worst: In the face of an obstinate and reluctant county council, the department fixed the salary at £1000 a year, together with vouched expenses, expressing the opinion that such a salary was necessary in order to attract the best candidates. Under pressure from the county council, however, the department has now assented to a salary of £800, agreeing that "sufficiently satisfactory candidates" can be attracted by that sum. The fall in demand from "the best" to "sufficiently satisfactory" is ominous, particularly in view of the necessity to the health of the metropolis of an efficient health service in the County Dublin.

A MEDICAL CENTENARIAN.

Last Saturday Deputy Inspector-General William Connolly, R.N. (retired), of Corrig Road, Dunlaoghaire, Co. Dublin, received the congratulations of many friends on celebrating his hundredth birthday. Dr. Connolly became a Licentiate of the Royal College of Surgeons in Ireland in 1856, and immediately ntered the Royal Navy as a surgeon. After a istinguished service he retired in 1886. His service fe therefore covered a period of extraordinary revolution in the Navy. Dr. Connolly is in excellent health of body and mind.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

CHEMICALS IN BREAD.

THE recommendations of the commission appointed by the Academy of Medicine to study the introduction of chemicals into flour were discussed at a meeting of the Academy on March 17th. In its report the commission criticised severely the use of chemicals in this way, but Prof. Désgrez upheld the opposite view, insisting that this employment of certain chemicals was warrantable both from the ecomonic and the hygienic point of view. He had conducted a series of experiments on animals, and had come to the conclusion that the chemicals in question were harmless. He accordingly asked the Academy to efer its decision pending the outcome of new experiments which he would like to see conducted by the *Société d'Hygiène Alimentaire.* The Academy in its unanimous rejection of Prof. Désgrez's amendment, incorporating the above views, condemned all chemical treatment of foodstuffs, and intimated that no experience could be too lengthy in forming an opinion of the harmlessness of chemicals applied to articles of daily food. The ill-effects of such chemicals may take long to appear, but when they have appeared they may be irremediable.

THE DOCTOR-DENTIST.

Reference has already been made in these columns to the proposal that dentistry shall be practised in France only by duly qualified doctors. At the opening of the discussion of this proposal at the Academy of Medicine this principle was advocated by a member of the commission appointed to study it. But at subsequent discussions opposition from various competent quarters has been strongly voiced, and the critics have included an ex-Minister of Health, Mr. Paul Strauss. Among the arguments brought forward against the ultimate suppression of the dentist without a medical degree is the unsatisfactory experience of countries which have attempted this innovation. Its critics would rather see the non-medical dentist given a better training than heretofore. Opposition is, of course, inevitable on the part of the non-medical dentists themselves, however much they may be assured that the proposed change will imply professional and social promotion.

CERTIFICATION WITHOUT EXAMINATION.

The Court of Appeal of Grenoble has given judgment in the case of a retired officer whose wife induced a Dr. Thilly to certify him as insane without having examined him. As a result of his certification this officer was admitted to a lunatic asylum. He objected strenuously and his friends, intervening on his behalf, secured his judicial examination by a board of three experts who came to the conclusion that he was sane. Meanwhile he had been confined in the asylum for 63 days. Accordingly, he sued his wife, Dr. Thilly, and the medical superintendent of the asylum for 400,000 francs. After losing the case in the first instance he appealed against the verdict as far as the two doctors were concerned. The Court of Appeal upheld the original verdict acquitting the medical superintendent of the asylum, but it awarded 8000 francs to the officer as damages against Dr. Thilly, who had also to contribute towards the costs of both suits.

BUCHAREST.

(FROM OUR OWN CORRESPONDENT.)

INDUSTRIAL HYGIENE IN RUMANIA.

INDUSTRIAL hygiene is relatively new in this country, because formerly Rumania was almost wholly agricultural. Only since the war, when Rumania acquired new territories abounding in industrial enterprises, has the problem of the regulation of industry cropped up. Those responsible have naturally tried to copy the most modern foreign systems, and are working out a system that will cover the hygiene of workshops, of individual workers, and of working-people outside their employment. An Act passed in 1930 provides for periodic compulsory medical visits of all employees at the cost of the employer, but fails to lay down penalties for those who do not comply with this regulation. The law of 1928 fixes the minimal age for factory workers at 14 and makes employers verify the ages of adults from their birth certificates. The minimal age for night workers is 18. The law prescribes that in mines and in factories where the work may be bad for the lungs (brush and twine factories, flour mills, spice mills) employees must be examined quarterly. Pregnant women must not be employed after the end of the eighth month, or within six weeks after childbirth. During this free period they get a subsidy from the sickness insurance office, which provides them also with free medical help. Working women, who breast-feed their babies, may be admitted to industrial establishments only if there is a suitable place, with a competent nurse, where their children can be left. This obligation refers to undertakings with 50 hands or more.

As regards the health of workers outside their employment there are as yet no orders and enactments. The authorities seem to feel that at present this side is best left to private organisations.

REDUCTION OF THE HEALTH BUDGET.

Owing to economic difficulties the revenues of the State have so greatly decreased that expenditure is being restricted in every direction. As might be expected, expenditure on health services has been the last to be curtailed, but the already unsatisfactory public health of the country is further threatened by the drastic reductions to be practised this year. These amount to about £300,000.

A SOCIAL HYGIENE JOURNAL.

Under the able editorship of Dr. Banu, at present professor of the hygienic high school in Bucharest, a monthly journal of social hygiene has now been launched here. Banu is an old worker in social hygiene, and his writings are known beyond the boundaries of Rumania. The time is hardly suitable for producing new journals, but he is so keen on the work that he has given a very large sum from his own pocket in order to realise his desire. He wants his journal to reach every medical practitioner in Rumania, and has accordingly set the subscription at the low figure of 200 lei (5*s.*) per annum. All the original articles are epitomised in French and German.

LEGISLATION AGAINST VENEREAL DISEASE.

Dr. A. Voina urges that the main part of the fight against venereal disease should be the education of the feeling of personal responsibility. On the other hand, most of the laws of modern States rest on such a basis or they could never be carried through, and this applies to the compulsory treatment of venereal disease patients, to punishment for spreading infection, to the compulsory segregation of infectious cases, and to the obligation to periodical medical examinations. The Rumanian legislature has had these points in mind in drafting the new law which will shortly come into force. The Ministry of Health has already introduced public instruction by special lectures delivered in towns and in villages by medical commissions which travel all over the country in motor caravans, equipped with laboratories for making blood tests and other analyses on the spot, and with cinema apparatus for projecting instructional films. The experience of these commissions is that the moral effect of their work is very great.

ALLEGED BREACH OF PROFESSIONAL CONFIDENCE.

In a large town of Rumania a specialist in venereal diseases was sitting in the big basin of a Turkish bath, when he saw one of his patients, suffering from acute anterior gonorrhœa, entering the bath. The doctor quickly went up to him and politely asked him not to go into the water because his ailment was contagious. The young man was offended by this advice and said that he passed urine before entering the establishment and thereby took all the necessary precautions. The doctor explained to him that as he might stay a quarter of an hour in the basin a new discharge would accumulate in his urethra, and it was his duty to prevent him from getting into the bath—if necessary by force. The patient still disputed, whereupon the doctor called the manager who also politely asked the man to leave. The latter reported the doctor for violating professional confidence, but the court decided in the doctor's favour, arguing that the interest of the community must be placed before that of the individual. The defendant would have been entirely wrong if he had not acted as he did. Accordingly, the plaintiff had to pay all costs.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED APRIL 4TH, 1931.

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 179; scarlet fever, 1342; diphtheria, 816; enteric fever, 23; pneumonia, 1445; puerperal fever, 33; puerperal pyrexia, 113; cerebro-spinal fever, 51; acute poliomyelitis, 2; acute polio-encephalitis, 9; encephalitis lethargica, 7; dysentery, 7; ophthalmia neonatorum, 84. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on April 7th–8th was as follows: Small-pox, 221 under treatment, 5 under observation (last week 224 and 2 respectively); scarlet fever, 1245; diphtheria, 1640; enteric fever, 78; measles, 126; whooping-cough, 446; puerperal fever, 24 (plus 11 babies); encephalitis lethargica, 125; poliomyelitis, 2; "other diseases," 18. At St. Margaret's Hospital there were 12 babies (plus mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox or enteric fever, 58 (1) from measles, 5 (3) from scarlet fever, 33 (5) from whooping-cough, 33 (6) from diphtheria, 49 (7) from diarrhœa and enteritis under two years, and 208 (24) from influenza. The figures in parentheses are those for London itself.

Six deaths from meningococcal meningitis occurred in London, 3 from 1–2 years, 1 from 5–15 years, and 2 from 35–45 years. Fourteen fatal cases of measles were reported from Birmingham, 6 each from Liverpool and Sunderland. Sunderland reported 3 deaths from whooping-cough. Diphtheria claimed 4 victims at Bradford, 3 at Birmingham. Diarrhœa accounted for 8 deaths at Manchester, 7 at Birmingham. The 164 fatal cases of influenza outside London are scattered over 75 great towns: 16 were reported from Sheffield, 12 from Bristol, and 11 from Birmingham.

The number of stillbirths notified during the week was 296 (corresponding to a rate of 51 per 1000 births), including 51 in London.

THE SERVICES

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Sub.-Lt. R. P. Davies and Proby. Surg. Lt. W. McF. Millar to be Surg. Lts.

ROYAL ARMY MEDICAL CORPS.

ARMY RESERVE OF OFFICERS.

The undermentioned having attained the age of liability to recall ceases to belong to the Res. of Off.: Lt.-Col. and Bt.-Col. L. W. Harrison.

Maj. G. K. Maurice to be Lt. Col.

The undermentioned Capts. from Supp. Res. of Off., be Capts: A. G. B. Duncan and H. Webb.

MILITIA.

Maj. G. E. Pepper retires on attaining the age limit, retains the rank of Maj.

INDIAN MEDICAL SERVICE.

Majs. J. A. Sinton, D. F. Murphy, C. J. Stocker, E. Doyle, C. M. Plumtre, L. F. Brandenbourg, and E. A. to be Lt. Cols.

Lt.-Col. E. Bisset retires.

DEATHS IN THE SERVICES.

Major-General Sir Thomas Percy Woodhouse, late R.A. who died on April 10th at the house of his son-in-law, L. Kingsale, in the seventy-fourth year of his age, was the youngest son of the late Mr. John Woodhouse of House, near Pontefract, Yorks. Educated at St. Paul's College, Stony Stratford, he studied medicine at St. Thomas's Hospital and obtained the L.S.A. in 1879. In the following year he took the M.R.C.S. Eng. and joined the Army Medical Service a year later. In the South African War he served from 1899 to 1902 and was present at the relief of Ladysmith (mentioned in despatches two medals and five clasps). From 1909 to 1913 he was Deputy Director of Medical Services in the Scottish Command, while he was Deputy Director of Medical Services in the Aldershot Command in 1914. Sir Thomas Percy Woodhouse, who had now reached the rank of Surgeon General, served as Director of Medical Services with the British Expeditionary Force in the Great War (mentioned in despatches five times, created C.B. in 1915, and K.C.M.G. in 1917). In 1918 he was promoted to Major-General, and served as Deputy Inspector of Medical Services at the War Office. He was a Knight of Grace of the Order of St. John, and he was a Commander of the Crown of Belgium, and a Commander of the Legion of Honour. He married in 1881 Mary Hannah, youngest daughter of Mr. J. Holmes Greaves, of Carlton Hall, near Pontefract, by whom he had one son and two daughters.

CORRESPONDENCE

FEVER IN MEN-OF-WAR AT MALTA.

To the Editor of THE LANCET.

SIR,—It may be permitted to a medical officer of the Navy, long retired, to thank Surgeon-Captain S. F. Dudley for the detailed examination given in his Milroy lectures[1] to the continuous records of illness in the Navy, and to the Royal College of Physicians which has made their publication possible.

It must have shocked us all to read his finding: "not a scrap of evidence that improved medical, as distinct from surgical, treatment has had any effect in shortening the average duration of naval illness in the last fifty years." Though the precise statement, as he makes it, is no doubt correct, in form it is perhaps misleading. Surely it is the Ehrlich-Hata treatment for syphilis (announced in 1910, and introduced into the Navy in the following year) that has reduced the combined figures for syphilis in the Navy, per 1000 men, as stated in 1910 and 1929, *from 34·27 cases to 10·44, from 0·7 invalids to 0·2,* from 0·05 deaths to 0·01, and from 1190 days of treatment to 301—a shortening of service lost through syphilis, per 1000 men in a year, by three-quarters?

I would venture also to submit that another view may be taken reasonably of the cause of "fever" in the Mediterranean, especially in the 'eighties of last century, mentioning that I served there myself from 1886 to 1889, in a masted ironclad or central battery ship, *Alexandra*, and in a turret ship, *Dreadnought*. From their structure the masted ironclads *had difficulty in ventilation, they also had large crews;* the turret ships had some artificial ventilation and fewer men to work their fewer, larger guns, and were *better ventilated. The greater prevalence of fever* in the 'eighties, shown in the charts, occurred when there were many masted ironclads on the station, and it diminished as they were replaced by turret and barbette ships.

In 1882 the *Superb* (masted ironclad) returned 8 cases of simple continued, 136 of paroxysmal remittent) fevers among her 625 men. Now what were those fevers? No one who has joined the profession within the last 30 years can imagine the mental fog which surrounded the diagnosis of fevers in the 'eighties. We *can now see they might have* been :—

(*a*) *Sandfly fever*, mentioned by Hennen in 1830: "the ites of these troublesome insects often throw the delicate ewcomer into a state of high fever." We knew nothing f them, and leave was scanty for our men. There would o more cases in the Army.

(*b*) *Enteric*, recognised by its severity, its mortality, and its intestinal lesions.

(*c*) *Brucella septicæmia*, usually indistinguishable in ships, known in hospitals by its prolonged course, relapses, rheumatism, and low mortality; its ætiology quite unknown.

(*d*) *Ague* or *intermittent fever*, with a characteristic syndrome, cured by quinine often, arising away from Malta, *perhaps in the Red Sea, freshly added to the Mediterranean* in 1882.

(*e*) *Malarial remittent fever*, same origin as the last; same treatment; only distinguished from the next, in the *Blue-books*, by Staff Surgeon T. L. Horner *of the Dreadnought* in 1887. With it was constantly confused

(*f*) The remittent fever we ordinarily met in ships at Malta, on which I wrote a thesis, naming it *Malta fever.* We medical *officers of the fleet called its slight cases* simple continued, its longer cases remittent. We thought it the same as we saw in military hospitals, though we felt those *were apt to be more serious and with worse rheumatism.* Bruce's discovery *of the M. melitensis* gave us a particular interest in it, but had not yet helped us to an ætiology or diagnosis.

Let us *go back to the cases. The Superb* in 1882 had the maximum, 234 cases in all, 70 invalidings, and 1 death. Part of her, the flying deck, was *overcrowded and ill-ventilated, and* was specially attacked—14 per cent., against 9 and 4 elsewhere.

In 1883 occurred the epidemic of "*Thalia* fever" on an overcrowded transport going to China. She had 479 men on board; a ship of her class would have had 250. She had about 80 cases, four invalids and no death. She reached Hong-Kong on the seventy-second day. Two cases *of erysipelas had been landed at Malta, three at Aden.* Her fever began at Colombo, eight landed at Singapore, ten on reaching Hong-Kong; *of these 18, 17 off the ill-ventilated lower deck.* The other cases developed in the *ships to which the men were sent; they did not infect* men of other ships. The fever had the facies of typhus. It was not infectious, and no one died, but it lasted dreadfully; *35 collected cases averaged 145·5* days under treatment, the chief sequela being *excruciating articular rheumatism.* Relapses were frequent. Surely this fever was due to want of ventilation, not to brucella septicæmia.

In 1884 the *Superb* returned 140 simple continued, and 124 remittent fever cases; *her medical officer claims that* improved ventilation has diminished incidence on the flying deck, but it still shows the highest *percentage.*

The *Alexandra* had in 1886 remittent fever cases 10 per cent. *of complement,* the *same in 1887, but in 1888 only* 3½ per cent. I put this down to better ventilation in 1888, when we *had always* a boiler alight drying the ship, and, as our stokehold was open, drawing the used *air* out of the lower part of the ship. In all that *commission* we had *no* case of brucella septicæmia in the wardroom; no one of us was long in hospital—the messman, yes, and the Admiral. In the mess I do not remember that we ever had porridge *for breakfast as in later years became a custom; we certainly did not drink milk as one heard officers did 10 to* 15 years later, when brucella septicæmia became prevalent; "officers one-third of cases" as a later Blue-book said.

The *Dreadnought,* in which I *served for two* months in 1888, had far more room for the men, and artificial ventilation, and little disease. In 1891 she reports how quickly influenza spread round her ship's company, but she was *then battened down owing to bad weather, and her auxiliary* natural ventilation was at an end. I would like to mention that in the same book it is reported that a case of simple continued fever in the *Australia* was invalided "owing to great debility and emaciation," which suggests meningococcal infection to me. Was this also with us in the Mediterranean and overlooked? The *Trafalgar,* turret ship with central battery, spoiling ventilation, reported 244 cases in 1891, but next year greater attention to ventilation (said her officers), and earlier leaving Malta (said her fleet surgeon) cut the number to 56.

Why are those cases continually ascribed to Malta by medical officers? It seems to be because Malta is the stuffiest harbour in the world. Shut in by the high fortifications, sheltered from slight breezes, doing special harm to stuffy ships. In the great *epidemic in the St. Jean d'Acre* in 1861, the temperature above the hammocks was noted as 81°, at which *temperature* expired *air stagnates*, and does not rise away from nor *fall from the breather.*[2]

My experience prejudices me to believe that fever in these ships long ago was due to poor ventilation. How precisely it produced effect I cannot say. I think chiefly by permitting dampness.

The driest ship I ever served in was the *Exmouth,* in the Channel in 1905–07. Weather was much the same, in January to March, in 1905 and 1906. She was better ventilated and drier the second year, and she had then far *fewer colds, as I had hoped.* One section, berthed lower than any other, had no colds at all. It alone had artificial ventilation, and housed the signalmen, who, "persecuting their vocation on the high and lofty bridge," as Kipling says, were most exposed *of all* men *to the* weather. I learned to pick signalmen out at quarters and musters by the notable redness of their lips, it may be said.

We want papers like *those Surgeon-Captain* Dudley has been good enough to put before us, but we also want studies of individual commissions of unhealthy ships, if any are left. Especially I would submit that rheumatism occurs as a sequela in other diseases than brucella septicæmia, and that future examinations must not depend on clinical diagnoses only when agglutinations, blood pictures, biochemical tests, &c., have become available for the elucidation of epidemics.—I am, Sir, yours faithfully,

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[1] THE LANCET, March 7th, 14th, and 28th.

[2] *Proc. Roy. Soc. Med., April, 1909 (Epidem. Sect.),* THE LANCET, 1909, i., 1238.

W. E. HOME,
Fleet-Surgeon.

Southborough, Kent, April 13th, 1931.

OVERCROWDING AS A FACTOR IN OUTBREAKS OF CEREBRO-SPINAL FEVER.

To the Editor of THE LANCET.

SIR,—To deal effectively with the points raised by Dr. Compton would take more space and time than is at my disposal. The incidence of cerebro-spinal fever or any other droplet-borne infection is doubtless dependent to some extent on indoor atmospheric humidity. But, even supposing the weight of this factor was generally less at sea than ashore, I cannot believe the difference in humidity was great enough to account for the great difference between the incidence of cerebro-spinal fever in the Navy afloat and ashore. Some of the facts on which I base this belief are:

(1) The carrier-rate was often as high in ships as in barracks.

(2) The high morbidity in ships of such droplet-borne infections as influenza and tonsillitis, which at times are as prevalent to-day when ventilation approaches perfection, as when ventilation was practically non-existent (as described in the third Milroy lecture).

(3) Cerebro-spinal fever has always been a rare naval disease. A search of the records of the Home Fleet for the 20 years 1860 to 1879 reveals only ten fatal cases of meningitis, in which middle-ear disease is not mentioned; seven of these were from boys in the training ships (average complement less than 3000). These numbers are, of course, very small, and it is hard to say if any, or all, of these cases were infected with *Neisseria meningitidis*. The reports however show, that meningitis was well recognised and described at the time, that it was rare at sea, that the mortality was 12 times as great in the training ships as in other ships, when the ventilation of both was bad, but equal.

To my mind (admittedly biased) the latent immunisation theory explains more *facts* in the epidemiology of cerebro-spinal fever than the indoor humidity theory. Both humidity and latently acquired immunity may have their share in determining the relative incidence of cerebro-spinal fever in the Navy ashore and afloat, but according to our respective experiences and prejudices I prefer to attach most weight to the latter, while Dr. Compton thinks humidity the more important factor.

I am, Sir, yours faithfully,
SHELDON F. DUDLEY.

Royal Naval Medical School, Greenwich, April 10th, 1931.

THE TERM HYPNOSIS.

To the Editor of THE LANCET.

SIR,—In my view the term basal hypnosis—as used, for example, in Dr. Magill's very interesting communication to THE LANCET for March 21st—is unsuitable and likely to cause confusion. The word hypnosis has its definite uses and applications which do not include reference to routine pre-anæsthetic sleep or quietude; anæsthetists must not run away with it for themselves. May I suggest that they try again?

I am, Sir, yours faithfully,
E. L. HOPEWELL-ASH.

Grosvenor-street, W., April 10th, 1931.

TREATMENT OF RHEUMATOID ARTHRITIS.

To the Editor of THE LANCET.

SIR,—In reply to Dr. Jenkins's courteous criticism published in your last issue (p. 835), I should like to make it clear that in condemning the use of vaccines, I referred to the simple suspensions, and made my objection on the grounds of absence of demonstrable specific effect. I agree, of course, that almost any form of vaccine may, if given in sufficient quantity in the late stage of rheumatoid arthritis, produce benefit by virtue of its action as a non-specific agent, and it is with this end in view that I give T.A.B. vaccine. Used in such a manner it is a matter of indifference whether focal sepsis has been found or not.

As to the question of a possible relationship between osteoarthritis and microbial activity, the more I see of the disease the more convinced I am that such relationship does not exist. Osteoarthritis is essentially degenerative in nature and commonly associated with hypothyroidism, rapidly increasing obesity, hyperpiesia, arterio-sclerosis, and/or a history of lifelong heavy manual labour. There is, I believe, something to be said for the view which I have expressed from time to time that the important ætiological factors are trauma and loss of vitality in varying proportion in each case.

I am, Sir, yours faithfully,
A. H. DOUTHWAITE.

London, W., April 13th, 1931.

POLYVALENT NATURAL ANTIBODY.

To the Editor of THE LANCET.

SIR,—In your last issue you published a letter from Dr. S. G. Billington who, after pointing out the vital importance that the antibody combinations known as Edwenil, Davenil, and Globenil should be accurately made and standardised, went on to state that he had no further association with the firm of E. H. Spicer & Co., Ltd., which had been offering these preparatio to the profession.

As this letter might be read as casting doubts on t reliability of products which are now being [illegible] factured and sold by my Company, I feel sure you [illegible] permit me to state that the preparation of Edwenil Davenil, and Globenil is being continued in laboratories at Watford, under precisely the [illegible] conditions as before. The manufacture of these antibodies is being carried out by expert chemists under medical supervision, and they are subjected [illegible] stringent tests which secure the highest possible standard of accuracy.

I am pleased to say that the numerous clinical reports received from medical men throughout the country continue to be uniformly satisfactory and show that Edwenil is of value in the entire range of endotoxic infections.

I am, Sir, yours faithfully,
E. H. SPICER,
Managing Director, E. H. Spicer and Co., Ltd.

Watford, Herts, April 13th, 1931.

THE LONDON VOLUNTARY HOSPITALS COMMITTEE.

To the Editor of THE LANCET.

SIR,—In your interesting account last week (p. 824) of the reception held at the Wellcome Historical Museum on March 26th you speak of Lord Macmillan as having acted as chairman of the "committee of relations between the voluntary and municipal hospitals in London." You are no doubt referring to the Voluntary Hospitals (Local Government Bill) Committee of the King's Fund, appointed by the Prince of Wales in January, 1929. Of this committee Mr. J. H. Whitley is chairman, and when he left for India Lord Macmillan was appointed vice-chairman. The committee published a memorandum on March 22nd of that year on the relations between voluntary hospitals and municipal hospitals under the Local Government Bill. This led to the appointment of a joint committee composed of representatives of the above committee, the conference of teaching hospitals in London, and the London Regional Committee of the British Hospitals Association, which prepared and published a scheme of voluntary hospital representation for the county of London under Sec. 13 of the Act. Lord Macmillan served on the joint committee as a representative of the King's Fund. The scheme was submitted to the London County Council and to the voluntary hospitals concerned, and obtained their approval, and the body thus constituted is now known as the London Voluntary Hospitals Committee, and is recognised by the London County Council as the body to be consulted by them under Sec. 13.

I am, Sir, yours faithfully,

E. A. H. JAY,

Secretary for Propaganda, King Edward's Hospital Fund for London.

April 13th, 1931.

RUSSIAN SCIENTISTS AT HOME.

To the Editor of THE LANCET.

SIR,—It is proposed to organise a tour of scientists to the U.S.S.R. and the first party will leave London Bridge by Soviet ship for Leningrad on July 18th. The return fare will be £18 inclusive. The party will spend a total of 16 days in Russia—three days in Leningrad, five days in Moscow, half a day in Nizhni-Novgorod and four days on the river down to Stalingrad (if desired) and the cost per day will be £1 per head inclusive—the balance of the days being spent in travelling. Meetings will be arranged which members of the party will be invited to address, and there will be excursions with guides to scientific institutions of interest to the members.

The Soviet authorities are prepared to give this tour second category accommodation at third category prices. The accommodation will be comfortable, and persons will sleep three or four in a room. Those wishing to sleep two in a room will pay five shillings per day extra. In the first instance the party will consist of 25 persons. If there is a large demand for places, a second party will be made up of 25; the Russian authorities are prepared to accommodate up to 100 persons if necessary. A further party may be arranged, if sufficient names are received, to leave London about the second week of August, returning to London in time for the British Association meeting.

The latest date for receiving applications is April 30th. Applications and all inquiries should be addressed to the Secretary, Society for Cultural Relations, 1, Montague-street, London, W.C.1.

We are, Sir, yours faithfully,

P. CHALMERS MITCHELL,
JULIAN HUXLEY,
E. C. SPRIGGE, *Chairman.*

April 8th, 1931.

OBITUARY

JAMES CAMPBELL HALL, M.B.Dub., D.L.

WE regret to announce the death of Dr. J. C. Hall, which took place after a short illness at his residence, Rowantree, Monaghan, on April 8th. He was born at Mourne Abbey, Kilkeel, Co. Down, in 1851, was educated at Dungannon Royal School, and took his medical course in Trinity College, Dublin, graduating in 1878. After spending some time in the asylum service he was appointed medical officer to the Scotstown dispensary district, and later physician to Monaghan County Fever Hospital. In 1890 he was appointed surgeon to Monaghan County Infirmary, a post he held for almost 40 years, and the operating theatre of which he equipped largely out of his own private purse. His skill was largely called upon by his medical colleagues as a consultant in the neighbouring counties.

Dr. Hall was a man of wide interests. He was a deputy-lieutenant for the county, a member of the grand jury, and took an active part in furthering the development of scientific farming among the agricultural community in which he lived. He was one of the most famous amateur rose growers in the country and was awarded by the National Rose Society, of which he was a vice-president, the Dean Hole Memorial Medal "in recognition of the meritorious services he rendered to the rose." He raised many new roses, five of which won the Gold Medal of the National Rose Society. Rose lovers will recognise the names of "Mrs. Campbell Hall" (named after his deceased wife), "Annie Crawford," "Muriel Wilson," "Julia Countess of Dartrey," and his latest success "Lord Rossmore."

In 1886 Dr. Hall contested the North Monaghan seat at Westminster in the Conservative interest but was unsuccessful.

THE LATE DR. CROZIER MAGEE.

Dr. Crozier Magee, whose death occurred a few weeks ago in a private hospital in Melbourne, Victoria, at the age of 71 years, had lived an interesting life. Born at Ballarat in 1859, he entered the service of the Bank of Australasia, and served in various towns in New South Wales. He resigned and took up pharmacy at Corowa, and on completion of his course travelled New South Wales and New Zealand for Messrs. Parke, Davis and Co., and introduced many drugs to the local medical profession. He then became pharmacist at the Brisbane Hospital (Queensland), where he met and married Nurse Rose Hardwicke. They settled at Wagga Wagga, N.S.W., where, and later at Albury, Dr. Magee held the position of superintendent, and Mrs. Magee that of matron. Dr. Magee then came to London and qualified in medicine from the London Hospital Medical School. On completing his course he made a voyage to Brazil as ship's surgeon in the cable ship *Dacia*. Returning to Australia in 1903, he practised in Penola, South Australia, until 1908, when after a voyage to China and Japan he bought a practice at Tungamah, Vict. Selling out in 1913 he made a voyage to Java, and on return served in the Commonwealth Government quarantine station at Sydney during the smallpox epidemic of that year. He then bought a practice at Branxholme, Vict., and remained there until the time of his death, his training and his great knowledge of drugs serving him in good stead. Dr. Magee leaves a widow and two sons.

PANEL PRACTICE

The London Public Medical Service.

FIGURES presented at the annual meeting of the Service made it clear that on the balance of gains and losses the number of subscribers has increased during the year by about 7 per cent., as much perhaps as could be expected when the class served is economically so depressed. The tendency to withdraw even in the winter months indicates there is a category of subscriber who joins for the purpose of securing treatment whilst ill and who discontinues as soon as normal health returns. It was suggested that membership is likely to gain in stability by attention to infant welfare. The central committee of the Service has taken pains to foster such work by issuing to members at cheap rates leaflets of instructions on breast-feeding, bottle-feeding, and feeding of weanlings. One member who started an infant welfare clinic on the committee's recommendation found it soon grow to considerable dimensions, with a resulting increase in the number of his subscribers. A mother who wants advice on how to keep her infant or her children well is a regular subscriber. With the help of the leaflets members of the Service can advise the whole family from the start, and forestall much childish illness. Such families are usually grateful and do not tend to drop out later.

The rates adopted in Kensington and Paddington have been found workable. In these areas the payment per week for a family of one member has been 4*d.* (or 6*d.*); of two members 8*d.*; of three members 11*d.*; of four or more members 1*s.* 1*d.* The yield per subscriber per week in Kensington is 3·96 *d.*, or after an administrative deduction of 25 per cent. 2·97 *d.*, distinctly more than the return in other areas on the older basis. A letter has been sent to individual members of hospital staffs, pointing out how their out-patient departments could be relieved of some of their work through the activities of the Service, with the avoidance of overlapping between specialists and general practitioners. As a result of this letter several consultants have become honorary members of the Service.

The Service is still not as well known as it might be, and the central committee is considering the question of publicity in the press. It seems specially desirable that insured persons who drop out of benefit should be aware of the advantages offered, and it has been the practice of some panel practitioners to send them notices drawing their attention to the Service. Since insured patients who are notified to their doctor as ceasing to be entitled to benefit nevertheless remain on his list until the end of the quarter, there is no possibility of such a notice being sent to any who are already on the list of another doctor. We may believe that the early difficulties in administering a new service of this kind are being surmounted and that the future is assured.

NATIONAL HOSPITAL, QUEEN-SQUARE.—A post-graduate course on diseases of the nervous system will be held at this hospital from May 4th to June 26th, consisting of clinical lectures and demonstrations at 3.30 P.M. each week-day, except Wednesday and Saturday, with out-patient teaching at 2 P.M. daily, except on Saturday, and pathological lectures at noon on Mondays. Clinical demonstrations, chiefly on methods of examination of the nervous system, will be given at 5 P.M. on Tuesdays and Thursdays, and, if there are enough applicants, lectures on anatomy and physiology at noon on Wednesdays and Fridays. Applications should be made to the Secretary, National Hospital, Queen-square, London, W.C.1.

MEDICAL NEWS

Royal College of Surgeons of England.

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The following was the Report of the Committee re mending the award.

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PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

MINISTRY OF HEALTH VOTE.

THE House of Commons reassembled on Tuesday, April 14th, after the Easter recess. The House went into Committee of Supply on the Civil Service Estimates.

On a vote of £19,616,212 for the salaries and expenses of the Ministry of Health,

SICKNESS AND DISABLEMENT BENEFIT.

Mr. GREENWOOD (Minister of Health), in moving the vote, said that national health insurance had given a good deal of trouble. They were all aware of the increased expenditure of approved societies in recent years on sickness and disablement benefit. About a year ago the report of the Government-Actuary drew attention to these very disturbing facts. Since then a special Inter-Departmental Committee had been investigating this matter further. It was very difficult to assess the exact weight which should be given to the various factors causing this increase of expenditure on insurance benefit. He was not satisfied that there had been any substantial deterioration in the general health. There might have been here and there and in particular areas. It was largely due to the fact that there had been an expansion of additional benefit using up reserves created in earlier years, and partly, to what was right, that insured persons were taking full advantage of the rights which the law had conferred on them. It was very important that in the early stages of illness the insured person should go to the doctor and get the earliest possible treatment. But behind all legitimate causes, everyone associated with approved society work knew there was undoubtedly a certain amount of laxity. There could be no desire on the part of any non-member to deprive any sick person of what was properly due to him; on the other hand, there would be no difference of opinion as to the desirability of depriving people of benefit to which they were not entitled.

POSITION OF APPROVED SOCIETIES.

They were issuing to all approved societies memoranda which, he hoped, would be of some assistance in the matter of certification and supervision of claims for benefit. Last year the amount paid out in sickness benefit was £2,000,000 less than in the previous year. That was due to the fact that, 1930, on the whole, was a pretty good year as compared with 1929 in regard to sickness, and also partly, no doubt, to the fact that there had been some improvement in administration. The great increase in the expediture of societies in sickness and disablement benefit was naturally reflected in the financial conditions of the approved societies. They had now almost completed the third valuation of the approved societies. It would be found that the large majority of societies would still have disposable surpluses out of which they would be able to continue to pay additional benefits during the next five years. There were societies, however—and especially those who had separate funds for women, where the drain had been more than the average—whose disposable surpluses, unfortunately, had fallen to very small dimensions or had entirely disappeared. That was a serious problem which was now under very sympathetic consideration.

MATERNAL MORTALITY.

There could be no difference of opinion as to the seriousness of the problem of maternal mortality. They could not attempt to justify the death of 3000 mothers every year in the existing state of knowledge. It made motherhood by far the most dangerous occupation of this country, and the Departmental Committee on Maternal Mortality, appointed b Mr. Chamberlain three years ago, had examin these deaths and had arrived at results which serious. He could say, on the basis of the finding this Committee, that not less than one-half— might be more—of these maternal deaths preventable. That was a national scandal which public could not continue to tolerate. After consideration of the report he approached the local authoriti in a circular pointing out to them ways in which the might coöperate in this problem. At the end March he had received replies from 70 local authoriti Of these, 36 had adopted proposals for improvi their maternity services, while a number of others ha these matters still under their consideration. Fiftee authorities were establishing or extending their antenatal clinics; 10 were providing private practitioners for antenatal examinations; 12 wer improving their arrangements for the supply of midwives; 21 were arranging consultant services; were providing or extending hospital accommodatio and a number of others were arranging ancilliary services. Thus, in the three months sin the circular went out, there had been an earnes intention on the part of the local authorities t coöperate with the Ministry in an attack on th problem. He was keeping in touch with the lo authorities to see that, so far as was possible, t lived up to their responsibilities. Any scheme would involve the services of those authoriti The figures of maternal mortality for the past ye were about the same as for the year before.

TRANSFER OF POOR-LAW FUNCTIONS.

They could congratulate themselves on the smoothness with which the transfer of functions under th Local Government Act, 1929, had taken place. On of the purposes of the Act was to promote the up of the old poor-law system. On the whole having regard that only one year had elapsed, a g deal had been done in the direction of the break of the poor-law. Sixteen county councils and county borough councils had found it possible t make immediate declarations in their schemes. consisted of 24 by county borough councils under th Public Health Acts, 1 by a county council, and by county borough councils under the Deficiency Acts; 3 by county councils and 30 county borough councils under the Maternity Child Welfare Act; 10 by county councils, and 33 county borough councils, under the Blind Act; 3 by county councils, and 16 by county bor councils under the Public Health (Tubercul Act; and 9 by county councils and 41 by cou borough councils under the Education Act. T county borough councils had appropriated the poor-law institutions to Public Health Act purp 3 county borough councils had appropriated law institutions for Maternity and Child Welfare purposes, and 4 county councils and 1 county bor council had appropriated their poor-law institutio for purposes of the Mental Deficiency Act. London County Council had appropriated 27 poor-l institutions for the purposes of general hospitals an 10 for the purpose of children's hospitals convalescent homes.

POST-GRADUTE MEDICAL SCHEME.

During the past year they had improved in various ways the conditions under which local authorities might obtain loans. The amount of loans sanctioned had increased from £27,700,000 to nearly £47,500,000. The loans sanctioned for schemes for the relief of unemployment had increased from £1,300,000 to £14,400,000. As to the post-graduate hospital and medical school, his predecessor had presided over a committee, and it had been his privilege to complete that work. He believed that the post-graduate hospital and medical school was perhaps the biggest single step taken in this country in the interests of public health since the war, and he made no party capital out of it at all. When the report of the Committee came to hand he asked Lord Chelmsford to be chairman of an organisation committee to work out details. Those details had been worked out and they were now beginning the task of setting up the governing body of this institution. The Government were prepared to provide up to £250,000 for the actual building of the medical school and they would continue to make grants to the school. He hoped and believed that in the very near future the school and hospital would be actually at work and would exercise a very profound influence on the public health of the country.

Appointments

GRANT, J., M.B., Ch.B. Glasg., D.P.H., has been appointed Medical Officer for the Burgh of Ayr.

MCALISTER, W. M., M.B., Ch.B. Edin., Medical Officer in charge of Mental Health Services of the Edinburgh Corporation and Medical Superintendent of Bangour village.

PEEL, A. A. F., D.M. Oxf., to the Chair of the Practice of Medicine in Anderson College, Glasgow.

Royal Eye Hospital, St. George's-circus, S.E.: SAVIN, L. H., F.R.C.S. Eng., and SORSBY, A., F.R.C.S. Eng., Honorary Assistant Surgeons.

Vacancies

For further information refer to the advertisement columns.

Bangor, Caernarvonshire and Anglesey Infirmary.—H.S. £200. Also Hon. Surg.

Beckenham, Kent, Bethlem Hospital, Monks Orchard, Eden Park. Two Res. H.P.'s. Each at rate of £25 per quarter.

Birkenhead General Hospital.—H.P. £100.

Birmingham, Dudley-road, Hospital.—Jun. Asst. M.O.'s. Each at rate of £200.

Birmingham Royal Cripples Hospital.—H.S. At rate of £200.

Birmingham, Selly Oak Hospital.—Res. Physician. £550.

Bolingbroke Hospital, Wandsworth Common, S.W.—H.S. At rate of £120.

Bradford Royal Infirmary.—H.P. and H.S. Each £150.

Brighton, Royal Alexandra Hospital for Sick Children.—H.P. £100.

Brighton, Royal Sussex County Hospital.—H.P. £150.

Burnley, Victoria Hospital.—H.P. At rate of £150.

Burton-on-Trent, County Borough.—Deputy M.O.H. &c. £600.

Burton-on-Trent General Infirmary.—Jun. H.S. £150. Also Sen. H.S. £200.

Cambridge, Addenbrooke's Hospital.—Res. Anæsthetist and Emergency Officer. Also H.S. Each at rate of £130.

Cardiff Royal Infirmary.—H.S. to Ophth. Dept. At rate of £75.

Carlisle, Cumberland Infirmary.—Res. M.O. At rate of £155.

Chailey Heritage Orthopædic Hospitals.—Res. M.O. £200.

Chesterfield and North Derbyshire Royal Hospital.—H.S. At rate of £150.

hild Guidance Council, 1, Canonbury-place, N.—Fellowships in Psychiatry. At rate of £150.

Ealing Borough.—Asst. M.O.H. £600.

nfield and Edmonton Joint Hospital Board, Winchmore Hill, N.—Res. Med. Supt. £700.

Gloucester, Gloucestershire Royal Infirmary, &c.—Second H.S. At rate of £120.

Great Yarmouth General Hospital.—H.S. £140.

Hellingly, East Sussex County Mental Hospital.—Jun. Asst. Res. M.O. £350.

Hospital for Epilepsy and Paralysis, Maida Vale, W.—Res. M.O. and H.P. At rate of £150 and £100 respectively.

Hospital for Women, Soho-square, W.—Res. M.O. At rate of £100.

Hove Borough, &c.—M.O.H. £1000.

Hull Royal Infirmary.—H.S. to Ophthal. and Ear, Nose and Throat Depts. At rate of £150.

Kingston-upon-Hull, City and County of.—Asst. Tub. Officer. £600.

Leicester Royal Infirmary.—Two Surgical Dressers. 10*s.* 6*d.* per week.

Lincoln County Hospital.—Jun. H.S. At rate of £150.

Liverpool, City of.—M.O. £1800.

Liverpool, Eye and Ear Infirmary.—H.S. to Ophth. Dept. £100.

Liverpool, Royal Children's Hospital.—Res. H.S. At rate of £100.

Macclesfield, Cheshire County Mental Hospital, Parkside.—Asst. M.O. £350.

Macclesfield General Infirmary.—2nd H.S. At rate of £150.

Manchester and Salford Hospital for Skin Diseases.—H.S. At rate of £100.

Manchester, Royal Children's Hospital, Pendlebury.—Res. Surg. O. At rate of £125.

Manchester, Royal Infirmary.—H.S. for Central Branch, Roby-street. At rate of £100.

Manchester Royal Infirmary.—Res. Surg. O. £200.

Newcastle-upon-Tyne, Hospital for Sick Children.—H.S. At rate of £100.

Newcastle-upon-Tyne, Royal Victoria Infirmary.—Two Res. Anæsthetists. Each at rate of £200.

Northampton General Hospital.—Hon. Surgeon.

Nottingham City Infirmary, Bucknall-road.—M.O. £350.

Nottingham General Hospital.—H.S. and H.P. Each at rate of £150.

Oldham Royal Infirmary.—H.S.'s to Special Depts. Each at rate of £175.

Pendleton, Hope Hospital.—Asst. Res. M.O. At rate of £250

Poplar Hospital for Accidents, East India Dock-road, E.—Sen. Res. O. £200.

Preston, County Mental Hospital, Whittingham.—Med. Supt. £950.

Queen's Hospital for Children, Hackney-road, E.—2 H.P.'s. Each at rate of £100. Also Cas. O. At rate of £100.

Radium Institute, Riding House-street, W.—H.S. At rate of £150.

Robertsbridge, Sussex, Darwell Hall Sanatorium.—Surgeon for Ear, Nose and Throat. 3 guineas per visit.

Rochdale Infirmary and Dispensary.—Senr. H.S. At rate of £250.

Rotherham Hospital.—H.P. £180. Cas. H.S. £120. Hon. Surgeon to Ear, Nose and Throat Dept. Also Hon. Dental Surgeon to Out-patients' Depts.

Royal Eye Hospital, St. George's Circus, Southwark, S.E.—H.S. and Asst. H.S. At rate of £150 and £100 respectively.

Royal Free Hospital, Gray's Inn-road, W.C.—Sen. Res. M.O. £150. Also Asst. Surgeon and Asst. Surgeon to Ear, Nose, and Throat Dept.

Royal Northern Hospital, Holloway, N.—Res. Out-patient Cas. O. and Anæsthetist. At rate of £70.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Cas. O. for Out-patient Dept. £150.

St. Helens Hospital.—H.S. £200.

St. John's Hospital, Lewisham, S.E.—Res. H.S. At rate of £100.

St. Marylebone General Dispensary, 30, Marylebone-lane, W.—Hon. Surgeon to Ear, Nose, and Throat Dept.

Samaritan, Free Hospital for Women, Marylebone-rd.—H.S. At rate of £100.

Scunthorpe and District War Memorial Hospital.—Second Res. Surgeon. £150.

Stafford, Staffordshire General Infirmary.—H.P. At rate of £150.

Stoke-on-Trent, North Staffordshire Royal Infirmary, Hartshill.—Hon. Asst. Surgeon.

Sunderland, Durham County and Sunderland Eye Infirmary.—Two H.S.'s. Each £350.

Swansea General and Eye Hospital.—Cas. O. £200.

Taunton, Taunton and Somerset Hospital.—H.P. £100.

Wallasey Victoria Central Hospital.—Jun. H.S. At rate of £100.

Walsall General Hospital.—H.S. At rate of £150.

Warrington Infirmary and Dispensary.—Anæsthetist. £150.

Wigan Infirmary.—H.S. At rate of £150.

Wrexham and East Denbighshire War Memorial Hospital.—Res. H.S. At rate of £150.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Mitcheldean (Glos.); New Galloway (Kirkcudbright); and at Poulton-le-Fylde (Lancs).

Births, Marriages, and Deaths

BIRTHS.

ARCHER.—On April 6th, at Lorna Lodge, Didsbury, Manchester, the wife of Dr. George Eric Archer, of a daughter.

LOWE.—On April 8th, the wife of John Burman Lowe, M.B., Ch.B., Lacock, Wilts, of a son.

MARRIAGES.

ADAMSON—SANDERSON.—On April 8th, at Cramond Church, Midlothian, William A. D. Adamson, M.B., to Lilian D. B. Sanderson, daughter of the late Mr. and Mrs. W. M. Sanderson, "Winton," Cramond Bridge.

DAGGER—DAVIES.—On April 11th, at St. Michael's, Eastbourne, Thomas Dagger, L.D.S., M.R.C.S., L.R.C.P., to Joan Lamprell, second daughter of Mr. and Mrs. Herbert Davies, of Eastbourne.

JOHNSON—COUTTS.—On April 2nd, at Bowness-on-Windermere, Athol J. Johnson, M.B., Ch.B., Colonial Medical Service, to Dorothy Gordon, younger daughter of Dr. F. J. H. Coutts, C.B., and Mrs. Coutts, of Bournemouth.

DEATHS.

BEVIR.—On April 13th, at a nursing home in Clifton, George Bevir, M.R.C.S., L.R.C.P., of Timsbury, near Bath, in his 52nd year.

HALL.—On April 8th, at Rowantree, Monaghan, after brief illness, James Campbell Hall, D.L., M.B.

WOODHOUSE.—On April 10th, at the house of his son-in-law, Lord Kingsale, in Devon, Major-General Sir Tom Percy Woodhouse, late R.A.M.C., in his 74th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

FELLOWSHIP IN PSYCHIATRY.—It is announced in our advertisement columns that the Child Guidance Council is offering one or two Fellowships in psychiatry, tenable at the London Child Guidance Clinic, to registered medical practitioners who hold the D.P.M. or have had suitable experience. The value of the Fellowship will be not less than £150 for six months' training.

NOTES, COMMENTS, AND ABSTRACTS

HOMER'S SURGEONS: MACHAON AND PODALIRIUS.

By S. Wood.

(From the Library, Royal College of Surgeons of England.)

Part I.

When the inconstant Helen of Troy deserted her husband to go with Paris she inspired the *Iliad* of Homer, which reveals to us the state of Greek medicine 3000 years ago. The passages of medical interest occurring in this graphic story have been so carefully annotated by Daremberg[1] and others that a further study of them would be superfluous. My purpose is to gather the scattered fragments relating to Machaon and Podalirius, the sons of Æsculapius and the "Fathers of Surgery," who were the chief medical officers attached to the Greek forces during their battles against the Trojans. They were valiant warriors as well as surgeons, and commanded 30 ships of the fleet that sailed to the siege of Troy:

> From Tricca, from Ithome rough and rude
> With rocks and glens, and from Œchalia, town
> Of Eurytus Œchalian-born, came forth
> Their war-like youth by Podalirius led
> And by Machaon, healers both expert
> Of all disease, and thirty ships were theirs.[2]

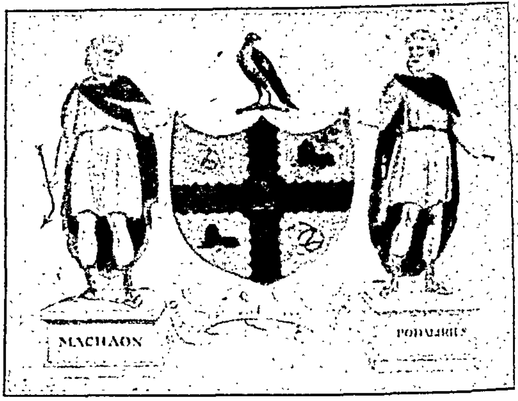
Gordon[3] says that the siege of Troy, and circumstances that led to it, are looked upon as but a western version of the events related in the Ramayana, the great epic of the Hindoos. Schliemann[4] and his colleague Dörpfeld,[4a] however, have demonstrated by their excavations at the site of ancient Troy that the *Iliad* is not a phantasy but a narration of events that occurred about 1200 B.C., and our two characters figure in the *Iliad* and other ancient writings in proof of their existence, though their reputed genealogy does not inspire the same confidence. They were supposed to be the sons of Æsculapius, the God of Medicine, but Renouard[5] believes that this description was used in a figurative sense and applied generally to men who devoted themselves to the practice of medicine. It is possible, however, that they were sons of Æsculapius, for contrary to the belief that he was a mythological character and not a real personage is the evidence of Homer and Pindar, who speak of him as a man. His memory was held in the very highest regard by the Greeks, by whom he was publicly deified at Athens in 420 B.C.[6] and in whose honour they erected temples, the Asclepieia, where his healing powers might be perpetuated for the benefit of succeeding generations.

The Two Brothers.

Machaon is usually referred to as the elder of the two brothers, and this is supported by Quintus Calaber's account of the death of Podalirius, who said "his dear brother had brought him up like a son after their father was taken into Heaven and that he had taught him to cure diseases."[7] Homer always names Podalirius first when he mentions the brothers together, but on this point the old historian Le Clerc[8] says "'tis only for the convenience of his Metre." Troy was taken by the Greeks 1184 B.C.,[9] and as Machaon was at that time a fully-fledged warrior it follows that he was born between 1219 and 1209 B.C. if we assume the age of such a man to be from 25 to 35 years. Both he and his father are said to have been born at Tricca in Thessaly, Æsculapius being a Thessalian prince and sovereign of the towns of Tricca and Œchalia. Nothing further is known of Machaon until he is introduced by Homer as a leader of troops and healer of disease.

Arctinus[10] (775–740 B.C.) says "the brothers were endowed with precious gifts. To Machaon was given delicate hands for drawing traits from the skin, to sew up and cure all wounds." The healing of Philoctetes' poisoned foot is adduced as an instance of his great skill, which was superior even to that of Chiron, his father's teacher, whose treatment failed in a similar case. Unfortunately there is little record of their work save the extraction of arrow and spear-heads, checking hæmorrhage by styptic preparations, and the applying of soothing ointments to wounded and bruised surfaces. No mention is made of amputations, setting of fractures, or tying of arteries.

The brothers, although called by Homer "healers of all disease," were powerless against the plague which attacked the Greek troops, and which is so well described at the opening of the *Iliad*. The sickness was attributed to the arrows of an angry god and it attacked horses, dogs, and men alike. After nine days, during which the funeral pyres burned continually, a council was held to consider what might be done. A captive maid was released to appease the wrath of the god, and the pestilence thereafter abated. With regard to this plague a modern note is struck by Dr. Edgeworth,[11] who suggests that the disease in question was dysentery, which has been endemic in the Mediterranean basin since prehistoric times—during the Great War the disease was terribly destructive in Gallipoli.



The Arms of the Corporation of Surgeons of London, showing as supporters Machaon on the left and Podalirius on the right.

An Arrow Wound.

There is an urgent call for Machaon when Menelaus is wounded in the side by an arrow treacherously shot by Pandarus. The wounded man makes light of his injury to Agammemnon, his brother, who is sighing over him, and says, "Be of good courage. The keen dart lighted not upon a deadly spot." Agammemnon replies, "Would it may be so, Menelaus. . . .

> But the hand of one
> Skilful to heal shall visit and shall dress
> The wound with drugs of pain-assuaging power,
> He ended, and his noble herald, next
> Bespake, Talthybius 'Haste, call hither quick
> The son of Æsculapius, leech renown'd
> The prince Machaon. Bid him fly to attend
> The war-like Chieftain Menelaus' . . . .
> He spake, nor him the herald disobey'd,
> But through the Greeks bright-arm'd his course began.
> The hero seeking earnest on all sides
> Machaon. Him, ere long, he stationed saw
> Amid the shielded-ranks of his brave band
> From steed-famed Tricca drawn, and at his side
> With accents ardour-wing'd, him thus addressed
> 'Haste, Asclepiades. The king of men
> Calls thee. Delay not. Thou must visit quick
> Brave Menelaus.'"[12]

Machaon hastens to his patient who stands surrounded and pressed upon in the manner of to-day by sympathetic and curious onlookers. Moreover, the crowd consists of select people "the bravest of Achaia's host," and in view of this formidable audience of chiefs Machaon proceeds to demonstrate his skill upon the unfortunate Menelaus.

. . . . he strove at once
To draw the arrow from his cincture forth,
But, drawing, bent the barbs. He therefor loosed
His broider'd belt, his hauberk and his quilt,
Work of the armourer, and laying bare
His body where the bitter shaft had plow'd
His flesh, he suck'ed the wound, then spread it o'er
With drugs of balmy power, given on a time
For friendship's sake by Chiron to his sire."[13]

Machaon's hasty and forcible treatment resulted in damage to the arrow, but owing to diverse translations it is difficult to determine what actually occurred. Cowper says that Machaon in drawing "bent" the barbs. Others render the word "broken," while Chapman[14] translates the line "which forth he brings without the forks." The last translation appears the least reliable; Machaon, the surgeon-general, would not have applied "drugs of balmy power" to heal the tissues over the barbs of an arrow—unless he had in mind the performance of a "two-stage" operation. There is a difference of opinion, too, regarding the treatment of the wound. *Machaon is said by some to have sucked out the* blood, but the argumentative Le Clerc[15] takes exception to this translation, and says, "He dressed Menelaus . . . wiping first the blood from the wound and not sucking it with his lips as a certain learned man, misled by the nearest signification of the word that Homer uses, has written." Eloy[16] and Portal[17] follow him, but these are clearly copying Le Clerc's words. Malgaigne[18] draws attention to the interesting point that Machaon must have carried dressings with him on the battle-field, for when *summoned by the herald he at once left his men and,* without returning to his tent, made his way to where the stricken King of Sparta awaited his ministrations.

Machaon Himself Injured.

The next incident concerns the wounding of Machaon himself. While fighting valiantly an arrow pierced his right shoulder, to the great dismay of the Greeks, who fought furiously around the wounded man to prevent him from being taken and killed by the enemy.

Not even then had the bold Greeks retired,
But that an arrow triple-barb'd dispatch'd
By Paris, Helen's mate, against the Chief
Machaon warring with distinguished force,
Pierced his right shoulder. For his sake alarm'd,
The valour-breathing Grecians fear'd, lest he
In that disastrous field should also fall.[19]

Nestor is called upon to take the wounded man into his chariot and, with all despatch, bear him out of the battle to a place of safety.

At once, Idomeneus of Crete approach'd
The noble Nestor, and him thus bespake.
"Arise Neleian Nestor! Pride of Greece!
Ascend thy chariot, and Machaon *placed*
Beside thee, bear him, instant, to the fleet,
For one, so skill'd in medicine, and to free
The inherent barb, is worth a multitude."
He said, nor the Geranian hero old
Aught hesitated, but into his seat
Ascended, and Machaon, son renown'd
Of Æsculapius, mounted at his side.
He lash'd the steeds, they not unwilling sought
The hollow ships, long their familiar home.[20]

The interest in Machaon's wound extends even to the great Achilles, who sends Patroclus hot-foot to ascertain if the injured man is indeed Machaon.

"The mares of *Nestor* all sweating bare him out of the battle, and also carried they Machaon, shepherd of the host. Then the noble Achilles beheld and was aware of him. And straightway he spoke to his own comrade, 'Go now, Patroclus, and ask Nestor who is this that he bringeth wounded from the war. Verily from behind he is like Machaon, that *child of* Asklepios, but I beheld not the eyes of the man, for the horses sped past me, straining forward eagerly.'"[21]

The chariot arrives at Nestor's hut where they receive the attention of the fair-tressed Hekamede, a chieftain's captive daughter, and a "nymph of form divine," who, in spite of her youthful appearance, seems to have been an apothecary, for she is credited with understanding the virtues of the herbs of all the earth, a considerable accomplishment in one so young.

Now when Neleian Nestor to his tent
Had brought Machaon, they alighted both.
. . . . On the beach awhile
Their tunics sweat-imbued in the cool air
They ventilated, facing the full breeze,
Then *on* soft couches in the tent reposed.
Meantime, their beverage Hekamede mix't . . .
She, first, before them placed a table bright
With feet caerulean; thirst provoking sauce
She brought them also in a brazen tray,
Garlick and honey new, and sacred meal.
Beside them, next, she placed a noble cup . . . .
The graceful virgin in that cup a draught
Mix'd for them, Pramnian wine and savoury cheese
Of goat's milk, grated with a brazen rasp,
Then sprinkled all with meal. The draught prepared
She gave it to their hand; they drinking, slaked
Their fiery thirst, and with each other sat
Conversing friendly . . . ."[22]

Machaon's wound was evidently not of a serious nature, *for nothing appears to have been attempted* in the way of treatment. The narrative relates that the patient and Nestor sat in friendly converse, which says much for Machaon's fortitude if he was seriously hurt. Patroclus, too, on his arrival at the tent, did not offer his help as he certainly would have done in a case of urgency, since on another occasion he was sufficiently skilful as a surgeon to treat Eurypylus by enlarging a wound with his knife in order to release an embedded weapon.[23] It may be that he considered the older and wiser Nestor to be equal to the occasion. Nestor, however, becoming uneasy at the increasing noise of battle, leaves the captive maid in charge of Machaon to whom he says, "*Bethink thee, noble Machaon,* what had best be done, lo, louder waxes the cry of the strong warriors by the ships. Nay, now sit where thou art, and drink the bright wine, till Hekamede shall heat warm water for the bath, and wash away the clotted blood, but I will speedily go forth and come to a place of outlook."[24]

Machaon. (Reproduced from the Sambuci book of portraits published at Amsterdam in 1612.)

A Strange Potion.

The curious mixture of wine, grated cheese, and barley given to the wounded has been subjected to a great deal of criticism, much of it adverse. Plato[25] decided against it saying that the draught was of an inflammatory nature and a strange potion to give to a wounded man, but with the reservation that the remedies of those days were intended for people of sound constitutions and not for those labouring under chronic affections, who evoked but little sympathy. Villoisin in his Scholia considers that these substances *presented* to Machaon, "the wounded offspring of the healing god," were viewed less as remedies than as refreshments necessary in consequence of his fatigue, and a similar observation is made by Eustathius in his commentaries on the works of Homer. Malgaigne[26] says that not sufficient distinction is made between the state of the recently wounded and the entirely different condition of an injury complicated by traumatic fever; he recalls that Larrey, the great French military surgeon, who gave wine to his wounded, even to those suffering amputation, was unconsciously a follower of the school of Machaon. According to Berdoe,[27] Homer's physicians were in the right. Good old wine was the best thing possible to restore a man fainting from loss of blood; as for the cheese, it was grated fine and therefore was a particularly nutritious food in a fairly digestible condition. As though the question were a debatable one even at the time of Troy, the following unsympathetic judgment is attributed to the brothers. "If the men are sound," they said, "wine and cheese will not hurt them; if they are not, let them die and make room for better men."[28]

Vergil[29] and others relate that Machaon entered Troy in the Wooden Horse, the town being taken immediately the occupants were released from that structure. In Dryden's translation of the Aeneid, however, it is not Machaon but his brother who was amongst the warriors concealed in the Wooden Horse. When the Greeks sailed away in their ships, pretending to abandon the siege, they left behind a huge wooden building which held a band of armed men who, under cover of the darkness, were to be released by Sinon, the spy. Although a spear thrust through its wall elicited groans from within, the Trojans, "blinded by their fate," dragged the "horse" inside the city gates and so accomplished their own destruction.

When Sinon, favoured by the partial gods,
Unlocked the horse and oped his dark abodes,
Restored to vital air our hidden foes,
Who joyful from their long confinement rose
Tysander bold, and Sthenelus their guide,
And dire Ulysses down the cable slide;
Then Thoas, Athamas, and Pyrrhus haste,
Nor was the Podalyrian last.[30]

Le Clerc[31] appears to be in error when he says that Machaon cured the lame Philoctetes on his return from Troy. Philoctetes, a Thessalian prince, was amongst those who sailed to make war against the city of Troy. During the voyage he and his companions landed on the island of Chrysa to see the altar of Athene, but Philoctetes, approaching it too closely, was bitten in the foot by the guardian serpent. The pain of his injury troubled him day and night, and the offensive nature of the wound caused the Greeks to leave him on the sacred island of Lemnos when the voyage was resumed. Ten years elapsed and the soothsayers said that Troy could not be taken until the great archer Philoctetes and the arrows given to him by Hercules should be brought against it. The crafty Ulysses and others were sent to fetch him but he refused to help those who had formerly deserted him. In spite of persuasion and attempts to steal the famous arrows, he clung to his decision until Hercules appeared to him in a supernatural manner and said, "Thou shalt go to the land of Troy, and first thou shalt be healed of thy grievous sickness, and afterwards thou shalt slay Paris with thine arrows, and shalt take the city of Troy." To Achilles he said, "Thou canst not take the city of Troy without this man, nor he without thee."[32]

Quintus Smyrnaeus[33] thus imagines the scene at the healing of Philoctetes by Podalirius:—

Men beheld, and all
Compassionated that great archer, crushed
By anguish of his hurt. But one drew near,
Podaleirius, godlike in his power to heal.
Swifter than thought he made him whole and sound;
For deftly on the wound he spread his salves,
Calling on his physician-father's name;
And soon the Achaans shouted all for joy,
All praising with one voice Asclepius' son.
Lovingly then they bathed him, and with oil
Anointed. All his heaviness of cheer
And misery, vanished by the Immortals' will;
And glad at heart were all that looked on him;
And from affliction he awoke to joy.
Over the bloodless face the flush of health
Glowed, and for wretched weakness mighty strength
Thrilled through him: goodly and great waxed all his limbs
. . . . So Philoctetes' erstwhile wasted frame
Was all requickened.

His recovery was so complete that he was able to slay Paris as foretold by Hercules.

The Death of Machaon.

There is the usual conflict of opinion regarding the fate of Machaon. Apollodorus[34] relates that Panthesilia, daughter of Otrere and Ares, slew many in battle and amongst them Machaon. Pausanias[35] writes that he was killed in single combat in front of Troy by Nireus, or, according to others, by Eurypylus, and was buried in Messenia whither his remains were removed by the care of Nestor and preserved as sacred relics. Quintus Smyrnaeus[36] who perhaps had before him the works of the Cyclic poets, which have since been lost, records in a graphic way the manner of Machaon's death at the hand of Eurypylus. In a general battle before Troy Nireus has just slain by Eurypylus, against whom Machaon turns to avenge his friend:—

With his spear he drave
At his right shoulder: strong albeit he was,
He touched him, and blood spurted from the gash.
Yet, ere he might leap back from grapple of death,
Fierce Eurypylus on Machaon rushed.
The long lance shot out swiftly, and pierced him through
On the right haunch; yet would he not give back,
Nor flinch from the onset, fast though flowed the blood.

In haste he snatched a huge stone from the ground,
And dashed it on the head of Telephus' son;
But his helm warded him from death or harm.
Then waxed Eurypylus more hotly wroth
With that strong warrior, and in fury of soul
Clear through Machaon's breast he drave his spear,
And through the midriff passed the gory point.
He fell, as falls beneath a lion's jaws
A bull, and round him clashed his glancing arms.

Swiftly Eurypylus plucked the lance of death
Out of the wound, and vaunting cried aloud:
Faint-breathing answered him the dying man,
"Eurypylus, thine own weird is to live
Not long: Fate is at point to meet thee here
On Troy's plain, and to still thine impious tongue."
So passed his spirit into Hades' halls.

Then to the dead man spake his conqueror:
"Now on the earth lie thou. What shall betide
Hereafter, care I not—yea, though this day
Death's doom stand at my feet. No man may live
For ever: each man's fate is preordained."

Teucer, a Greek leader, on seeing Machaon's fall urges his men to greater deeds in order to prevent the body falling into the hands of their enemies:

With a great voice he raised the rescue-cry:
"Charge, Argives! Flinch not from the charging foe!
For shame unspeakable shall cover us
If Trojan men hale back to Ilium
Noble Machaon and Nireus godlike-fair."

The rescue caused a host of men to die on either side in the desperate fighting that ensued, but at last the few Danaans who survived bore the bodies back to the ships.

News of his brother's fate is brought to Podalirius who is hard at work dressing the injuries of the struck down in the battle. The merciful surgeon transformed into a relentless avenger:

He clad him in his armour. For conflict grim
He panted: boiled the mad blood round his heart
He leapt amidst the foemen; his swift hands
Swung the snake-headed javelin up, and hurled,
And slew with its winged speed Agamestor's son
Cleitus. Then by his warrior-brother laid he low
Lassus . . . .

Next morning death-dues were rendered to the fallen. The Greeks mourned over the grave for Nireus, and for Machaon

whom they honoured aye,
For his deep wisdom, as the immortal gods.
One mound they swiftly heaped above these twain.
Then in the plain once more did murderous war
Madden.

Podalirius is distracted with grief, and seeks to slay himself with his sword but is restrained by friends. He is looking amongst his herbs for a deadly drug when Nestor appears with words of comfort:

"Refrain from bitter moan and deadly grief,
My son. It is not for a wise man's honour
To wail, as doth a woman, o'er the fallen.
His end was worthy his life
Endure thy sore grief, even as I endured,
Who lost a son, a mortal man must bear
All joys, all griefs, that God vouchsafes to send"

Made answer the heart-stricken one, while still
Wet were his cheeks with ever-flowing tears :
‘ Father, mine heart is bowed 'neath crushing grief
For a brother passing wise, who fostered me
Even as a son. When to the heavens has passed
Our father, in his arms he cradled me ;
Gladly he taught me all his healing lore ;
We shared one table ; in one bed we lay.
We had all things in common—these, and love
My grief cannot forget, nor I desire,
Now he is dead, to see the light of life."

Then spake the old man to the stricken one :
" To all men Fate assigns one same sad lot,
Bereavement : All happy is no living man
From the beginning to the end our life is short
Beseems not then in grief to live. Hope on,
Still hope for better days ; chain not to woo
Thine heart. There is a saying among men
That to the heavens unperishing mount the souls
Of good men. Both to God and man
Dear was thy brother, good to brother men,
And son of an Immortal. Sure am I
That to the company of gods shall he
Ascend, by intercession of thy sire."

Then raised he the reluctant mourner up
With comfortable words. From that dark grave
He drew him, backwards gazing oft with groans,
To the ships they came.

Lesches, the author of the epic called the " Little Iliad " also says that Machaon was killed by Eurypylus, son of Telephus. That is why the following rule was observed in the sanctuary of Æsculapius at Pergamus. Though they began the hymns with Telephus they aid not a word about Eurypylus in them ; indeed, hey would not even name him in the temple because hey knew that he was the murderer of Machaon.[37]

Rival Versions of the Story.

Sprengel [38] has a different and less tragic story to ell. His version is that Machaon survived the Trojan war and passed the remainder of his life in Messenia with or near the sage Nestor. In this country he founded two towns bearing the same names as those of which his father had been sovereign, Tricca and Œchalia. His wife was Anticlea, daughter of Diocles, King of Messenia, and by her he had two sons, Nicomachus and Gorgamus, who resided at Pheræ and possessed the kingdom of their grandfather till the Heraclians, on their return from Troy, made themselves masters of Messenia and the rest of Peloponnesus, whence they drove both them and others. Pausanius mentions some other sons of Machaon, as Sphyrus, Alexanor, and Polymocrates, who followed their father's profession which was carefully preserved in the family. The same author questions whether Machaon was a king in his own right or by virtue of his marriage, but Homer calls him a " Pastor of the People " which is the title he gives to Agammemnon and other kings. The consternation of the Greeks when he, " leader revered," was wounded, also proves that he was a person of great importance.

Other classical writers have followed Homer in eferring to Machaon. Ovid [39] mentions him in the first book of *De Ponto*,

Utque Machionlis Poeantius atibus heros.

and in the third book,

Firma valent per se, nullumque Machaona quaerunt.

Martial [40] also brings his name in a general manner into the following passage :

Zoilus aegrotat, faciut hac stragula febrem
Si fuerit sanus, coccina quid faciet ?
Quid thorus a nilo. Quid sidone tinctus olenti
Ostendit stultas quid nisi morbus opes ?
Quid tibi cu Medicis demicte Machaonas ones
Vis fieri sanus ? Stragula sume mea.

His memory is perpetuated in science in *Papilio Machaon*, the name applied to the swallow-tailed butterfly.

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A USEFUL SAINT.

To the Editor of THE LANCET.

SIR,—" Etymologist " asks (page 842) who was Saint Acaire. He was a bishop of Noyon, who died in 630 (A.D., of course). His relics are credited with the virtue of curing those of soured temper. *Avoir le mal de Saint-Acaire* is to be sour, cross-grained, difficult, cranky, but not, I think, mad or insane. The *fête* of the saint is the twenty-seventh of November. I am, Sir, yours faithfully,

April 10th, 1931. F. G. C.

To the Editor of THE LANCET.

SIR,—" Etymologist " may be interested to know that Brachet in his " Dictionnaire étymologique de la langue française " shows the etymology of acariâtre as " unknown." Probably the Saint Acaire of Larousse is as mythical as most other saintly curers of disease. I am, Sir, yours faithfully,

April 10th, 1931. A. G. C.

THE MODERN PARENT CRITICISED.

A BOOK[1] dedicated by its author " To my three children . . . whom I have often annoyed," deserves attention. Dr. Myers proceeds to describe with faithfulness and humour the many ways in which parents may irritate their offspring. He addresses himself to parents directly, using colloquial language and avoiding pseudo-scientific terminology. Unlike many psychologists he does not utterly condemn corporal punishment, and even deplores the difficulties of a mother compelled to administer all the slaps herself owing to lack of coöperation on the part of the father. He makes good use of the emphasis to be obtained by repeating his opinions and observations in several ways. Nor is his sympathy confined wholly to the child ; doubtful of the effects of his salutary criticism on the morale of parents he ends many of his chapters by exhorting them to count their successes rather than their failures, and to remember that their motives were above reproach. His investigations of problem parents cover those who are discourteous, quarrelsome, scolding, or inconsistent, those who make the social graces painful to their children, who act childishly towards them, who teach them to lie or tempt them to steal, and those who play upon the emotions of the child until he becomes callous in self defence.

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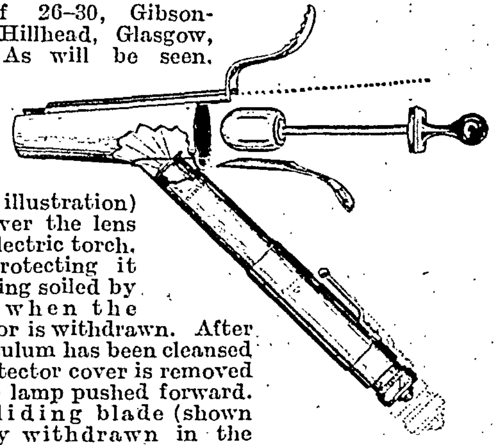
[1] The Modern Parent: A Practical Guide to Everyday Problems. By Garry Cleveland Myers, Ph.D., Head, Division of Parental Education, Cleveland College, Western Reserve University. London: Williams and Norgate, Ltd. 1930. Pp. 350. 8s. 6d.

ELECTRIC RECTOSCOPE.

AN improved form of speculum for use in rectal diagnosis and in the injection treatment of hæmorrhoids has been placed on the market by Messrs. John Smith and Son, of 26–30, Gibson-street, Hillhead, Glasgow, W. 2. As will be seen, a protector cover (shown withdrawn in the illustration) slides over the lens of the electric torch, thus protecting it from being soiled by fæces when the obturator is withdrawn. After the speculum has been cleansed the protector cover is removed and the lamp pushed forward. The sliding blade (shown partially withdrawn in the illustration) is then wholly withdrawn, and the wall of the anal canal and rectum is thus exposed through the whole length of the speculum. The tube carrying the electric bulb and battery is fitted with a switch which permits the light to be kept on continuously or cut off as required, while the torch is detachable so that the instrument may be sterilised.



NEW PREPARATIONS.

KOLA ASTIER (P. Astier Laboratories, 41–47, Rue du Docteur-Blanche, Paris. Agents, Messrs. Wilcox, Jozeau and Co., 15, Great St. Andrew-street, London, W.C.).—Samples of this preparation are being distributed to the medical profession with a description of the chemical composition, when the claim made for it that it forms a good general tonic is substantiated by all pharmacological inquiry into the caffeine content of kola. The cardiotonic action of the drug is the property to which special attention is drawn in recommending its employment in chronic nervous disorders, convalescence after long illness, or premature senile changes.

From the same firm we have received a sample of ARHÉOL, a preparation of sandal wood, for use in gonorrhœa and vesicular disorders. Care has been taken to use a very pure and therefore active sandal-wood oil, producing a balsamic of constant composition which is made up in capsular form.

We have received also from the Astier Laboratories samples of COLITIQUE, an anticolibacillary vaccine, and STALYSINE, an antistaphylococcic vaccine, both of which are prepared according to the technique of Dr. Fisch. To the value of these preparations a certain amount of medical support is forthcoming, and it may be noted, as evidence of care on the part of the firm, that the date of manufacture is in each case stated on the containing boxes, with the warning that the preparations are not guaranteed to remain active for more than two years.

VIODAR (Mr. W. Martindale, 12, New Cavendish-street, London, W.) is an oily preparation containing free iodine, to which the violet colour is due, and is made in two strengths, 1 in 1000 and 1 in 200, for external and internal use. While the standardised proportions of iodine in oily combination are present, the contents are stable in stoppered bottles at ordinary temperatures, the iodine being liberated at the temperature of the body. Preparations of iodine are liable to turn acid, and are then not tolerated by all subjects, a particular susceptibility having often been noted, but the manufacturer has reason to believe that this trouble will not occur with Viodar. The preparation has, in fact, been found valuable in the treatment of skin affections, reasonable watchfulness being exercised. Viodar for internal use has a dosage varying with its strength; the 1 in 1000 preparation, it is suggested after practical trial, should be taken in doses of from one to two teaspoonfuls, a teaspoonful containing approximately gr. 1/20 of iodine virtually in a nascent condition. The equivalent dose of gr. 1/20 is obtained by the administration of 10 minims of the stronger preparation. It seems we have here an iodine compound which should be valuable for both external and internal use, in the latter case the activity of the iodides being represented in a palatable form.

BRITISH DRUG HOUSES, LTD. (Graham-street, City-road, London, N.) will supply doctors with the following three new preparations: Gaster Siccata, Ergodex, and Vitamin A (B.D.H.). GASTER SICCATA is a preparation of desiccated stomach designed for the treatment of pernicious anæmia, the sto of healthy animals being selected for the purpose. It is supplied in aluminium tubes containing 10 g., this being a day's dose, although the actual dosage will be dictated by the condition of the patient and the result of blood counts. It makes a smooth palatable mixture when suspended in milk, and the mixture is practically tasteless, but can be fla if desired.—ERGODEX contains ergotoxine and ergotinine of the official ergot of rye, the activity of batch being tested physiologically and standardised to contain 0·03 per cent. of ergotoxine. The drug administered orally, the dose varying from 10 to minims according to the individual case and the instructions of the medical man.—VITAMIN A (B.D.H.) solution of vitamin A standardised according to known methods, biologically upon rats, and by test (the antimony trichloride test) devised in the B.D.H. laboratories. The preparation is issued in the form of capsules which contain 3 minims of the standardised solution, the dose being one to t capsules daily. The capsules are issued in tins of 5

LACQUIN (Cow and Gate, Ltd., Guildford).—T firm has placed on the market a preparation of full cream milk to which quinine has been added, making a food tonic of particular application in places where malaria is prevalent. The quinine is provided in a concentrated and digestible form, one teaspoonful of Lacquin containing grs. 2½ of quinine. The manufacturers have evidence that the preparation has a slightly laxative effect and is very easy of digestion.

MILK EPIDEMICS.

X.Y.Z.—We saw the suggestion in a contemporary that, in the majority of milk epidemics, the trouble originates from the premises of a producer who prides himself on the precautions taken to ensure a clean raw milk. Those who are called on to investigate these epidemics usually find it very difficult to say how the milk has become infected, and there are few dairy farmers who do not pride themselves on the precautions they take. All milk epidemics, suspected or proved, are reported to the Ministry of Health which alone is in a position to sift the evidence. The claim of a dairy farmer to have taken adequate precautions will hardly count for much if he does not produce graded milk. It would be instructive to know how many milk-borne epidemics have occurred on dairy farms which supply graded milk since the Milk Designations Order came into operation.

PHYSICIAN.—There has been compiled such a list, but it was an imperfect one. As there can be no common opinion of what the word "qualified" means in this connexion, every list would be open to criticism. Will "Physician," who has omitted to give his or her name, state what proof of qualification is desired for purposes of discrimination?

ADDRESSES AND ORIGINAL ARTICLES

ORTHODOXY AND HETERODOXY IN SURGERY.*

By W. Heneage Ogilvie, M.D., M.Ch. Oxf., F.R.C.S. Eng.,

ASSISTANT SURGEON TO GUY'S HOSPITAL AND TO THE HAMPSTEAD GENERAL HOSPITAL.

It is an ancient and fundamental problem of all institutions to combine security with progress, tradition with discovery. Security without progress is stagnation and decay; progress without security leads to anarchy and ruin.

Orthodoxy is defined as the holding of right, or accepted, views. The word is applied to religion, morals, architecture, the arts, car design—in fact, to any matter of public interest; the private concerns of an individual can hardly be orthodox. In matters affecting the many, a generally accepted standard of orthodoxy is necessary, from which standard any departures are judged. Such departures are termed heterodox; they are continually being made in all directions, and those which stand the test of time, in time become orthodox.

Orthodoxy implies a certain degree of doubt—the possibility of another opinion. In this way it resembles truth. A statement which is axiomatic is not orthodox; it is rarely said to be true, but, rather, accurate. A street plan, an anatomical description, a sum in arithmetic, are accurate rather than true, true rather than orthodox. Orthodoxy and truth are both matters of belief, and what is true and what is orthodox is the belief of the great majority. But to say that a thing is orthodox expresses no view as to the value of a contrary tenet; to say that it is true implies that any other opinion is, in the view of the speaker, untenable.

Tradition is, or should be, the accumulated wisdom of the past—wisdom rather than knowledge, because it includes elements not to be learned from books, but from the experience of life, and, therefore, not to be conveyed by books, but only by experience. True education is *arranged* experience; we do not say to our students: "Take a limb and see what you can find in it," but, "Reflect these structures in this order and you will, or should, find such and such vessels, nerves, or muscles."

Orthodoxy represents chiefly the wisdom and learning of the past and it provides the security of that wisdom. An orthodox moralist, scientist, or surgeon can be trusted to have as much learning as the last generation of his craft. This may seem a small commendation, but in real life, and especially in medicine and morals, it is, in fact, a great one, because over much the greater part of the globe there is no assurance to the public that a physician or a moralist has any learning at all. A man may set up as a preacher or a doctor of medicine without knowing as much of either art as an African witch-doctor.

This, then, is the value of orthodoxy and the machinery of examinations, degrees, and associations which upholds it. This machinery makes certain that a doctor of divinity or of medicine does at least know something of his job. In practice, the public has no other assurance than the label provided by the degree—a degree granted by a committee of the orthodox for a knowledge of orthodox practice. I am not using the word orthodox in any derogatory sense, but as an exact description of the truth, because orthodoxy means, in this connexion, all that which is approved by the committee of experts responsible for the standards; what is heterodox this year may be orthodox next.

There is a much greater need for orthodoxy in surgery than in politics or religion, for the subjects of State or church share with others disabilities or dangers not usually very immediate, whereas a sick man bears an anxiety and responsibility and incurs a danger which is not shared and cannot be put off. He has his back to the wall.

Put yourselves in the place of such a man and suppose that there is no established doctrine of medicine or orthodoxy. One friend tells him to go to so-and-so, another to someone else, and he has no better reason than opinion to choose one rather than the other; nothing better than opinion, because nothing better exists. To him and his friends surgery and medicine are mysteries deeper than Hebrew or English law. It would take him years to acquire sufficient knowledge to judge in his own case; and notice, also, that (always supposing there is no orthodoxy, no established machinery of tests, education, degrees) such a man would not even know where to go in order to give himself the necessary education. He must risk being swindled by teachers almost as ignorant as himself, or by prejudiced pedants a century behind the times.

Everyone knows that this was actually the case of the sick man in surgery not so many years ago, and that it still is the case in a great part of the world. It is because of the misery and confusion caused by the absence of any orthodox standards that they were set up and maintained, and are nowadays defended.

True, they are not so much valued to-day by the laity, because they have no experience of the suffering produced by their absence, but they are strongly maintained and defended by surgeons and physicians, who are well aware, by experience as well as the history of their art, of their value to the whole community. Every medical man has, at some time or other, to patch the sorry work of some quack, if it can be patched; and a very little imagination can tell him what was the state of the sick before surgeons and physicians were obliged to learn something about their profession. In fact, this experience is apt to make him too much the supporter of orthodoxy, too much the enemy of new suggestions, especially from outside the fold.

The Heterodox on Trial.

This leads us directly to the centre of the problem: how to devise machinery for testing the heterodox and for admitting the valuable parts of it into the body of the orthodox. Failure to solve this problem—which is as old as society itself—has destroyed countless kingdoms, churches, and orders. If no machinery exists, as in the case of the old French monarchy, there follows a decay, and the disaster called "revolution," which destroys the good of sound tradition with the bad of self-satisfaction. If too much machinery exists, as in the case of the old Roman religion, which coöpted every new god as soon as he was proposed, tradition is swamped and society finds itself without any standards at all.

This problem, which has proved so difficult to statesmen and churchmen, is even more difficult to surgeons, on account of the special nature of their craft. On the continent the system of large professorial clinics, where the word of one man is law over decades, while assistants grow old and fixed in his service, tends to the perpetuation of local tradition and the cramping of true originality as against mere showmanship. In America, on the other hand, the orthodoxy of past generations is often wrongly condemned on insufficient grounds; treatment is largely a matter of fashion, and each innovation is accepted as an advance, till a newer method displaces it.

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* The substance of an address delivered to the Chichester Clinical Society.

How, then, is the heterodox, the new, to be tested and admitted into the body of the orthodox, the old and tried? In practice, of course, new treatments, new discoveries, are continually tested and admitted by a dozen different routes; but nearly always, be it observed, from orthodox sources—that is to say, doctors, already proved orthodox, having made discoveries in their practice, bring them to the attention of their colleagues and pupils, either by writing about them, or teaching them, and after a general discussion, carried on for some years in the medical press and among medical men, they are either accepted and enter orthodoxy by way of the accepted text-books, or are dropped.

OBJECTIONS TO THE PRESENT SYSTEM OF TESTING.

The objection made against this system as it works is that it does not work well. Critics point out that it is the original system, as old as medicine itself, which goes back (according to one suggestion) to a period before the appearance of man; that it is slow, erratic, uncertain. One discovery, by a stroke of luck, may catch the eye of an authority and be quickly tested, approved, and taught; another may be overlooked for years, or forgotten altogether.

To the first objection—that the system is old and unbusinesslike, or, as one might say, no system at all—the answer is that it exists, like the British Constitution, only on sufferance, and *dum bene gesserit*. If anyone can devise improvements in it, or a better one, it will be instantly suspended by that fact. To the second objection—that it is uncertain—it may be answered that it is nowadays much less so than it used to be, simply because it is much easier for the medical researcher to get his results and suggestions published, and because the profession, as a whole, is much more receptive of new ideas, much more critical, in the true sense of the word, and less dogmatic.

But the real and unanswerable defence is that, in the present circumstances, there is no other imaginable that could fulfil the necessary conditions. Let us recapitulate these circumstances and conditions. The circumstances are a lay world, ignorant of medicine, of scientific method and, to a very large extent, of the weakness of the uninformed human judgment, against which scientific method has devised its mechanical safeguards—that is to say, a vast mass of population ready to be deceived by any specious lie or self-deceiving wonder-worker; and among this immense gullible crowd a comparatively small number of doctors, surgeons, and researchers, working singly or in groups, but divided from each other not only by space and opinion but also by language and great differences of outlook and education.

It might be suggested that surgery, like statecraft, requires an international headquarters, like the League of Nations, or, rather, the Labour Bureau at Geneva; a central office, where all new discoveries would be demonstrated and all records filed. But anyone who understands the complicated nature of our problems will know what such an institute, to be effective, would cost in buildings and staff, with what suspicion and slights it would have to deal, and, also, how easy it would be for it to earn suspicion and deserve contempt. For it would be surrounded by the pitfalls that bureaucracies dig for themselves—dogmatism, red tape, the superiority complex; in fact, those very perils of which dogmatic orthodoxy itself is the begetter. It would become a Royal Academy of Medicine.

But even if we suppose that such an institution could be devised to avoid academism, we have to admit that it does not exist yet, and is not likely to do so for at least as long as the League of Nations is regarded by half the world as a confidence trick.

So that we are obliged, willy-nilly, to continue in the present system, however unsystematic, and, returning to the problem, we find it to be this: how to improve the present system.

EDUCATION AND SCIENTIFIC ADVANCE.

Now, it seems to me that all institutions, all systems, depend chiefly on the men who work them. Give the British Constitution to Italy, Spain, Poland, America, Germany, Greece, Bengal, and you will find in a year or two that it has changed into something so entirely different that the very Speaker would not recognise it. The reason is that Italians, Poles, Greeks, and Hindus have different ideas; their environment, their history—in a word, their education is different.

If we want to know the cause of that dogmatism which assailed Lister with a bitterness and injustice which appear so inexplicable to us, we have to ask: what kind of men were they who called themselves scientific; what kind of education and environment made them what they were? And we see that the environment was one of conservative reaction; the education was empirical and dogmatic. They were told: "Do this! Do that! This is the way to operate for stone; this tumour is inoperable." They were trained as craftsmen, and not as scientific men.

For the mark of the scientific man is an inquiring and independent spirit. He takes nothing for granted; he is ready for the most surprising development, the most bizarre suggestions, and he brings to both—the orthodox that is accepted and the heterodox that has been proposed—the same critical judgment and the exact methods of practical test and trial.

It seems to me, therefore, that the surest and, perhaps, the only means of combining the security of tradition with the life of progress is by the education of every medical student in the true scientific character. Let it be impressed on each from the beginning of his training that the doctor is not only a servant of the public, bound by the oath of Hippocrates, but a scientific man—one of the same profession with Aristotle, Boyle, Darwin, as well as with Arbuthnot and Lister—and that he cannot default in either capacity without injury to the other and danger to the honourable fame of his calling. Let his orthodoxy be that of Newton and Einstein and we need not fear for the progress of medicine.

The Outlook of To-day.

I have dwelt thus far upon the abstract problems of orthodoxy and heterodoxy—problems which are more philosophical than surgical—and must pass on to consider briefly how these conclusions affect our outlook upon the questions that confront us to-day.

A teacher of the last generation asserted, with considerable justification at the time, that the discoveries of the scientist become incorporated only after considerable delay in the practice of the clinician. It is idle to pretend that there is any failure in coördination between research and practice to-day. The wards and the laboratories work hand in hand; physician and biochemist, surgeon and physiologist, radiotherapist and physicist, bring to each other their problems for solution, their discoveries for practical test. Every branch of our art has been brought, within the last few years, to a higher degree of perfection by methods which have sprung from patient quest in research departments; diagnosis has been enriched by cholecystography and intravenous pyelography, prognosis by tests for the estimation of renal, hepatic, and cardiac function; treatment by such remedies as insulin in diabetes and gas gangrene serum in paralytic ileus. Nor is it only from the laboratories that additions to orthodox teaching have been culled; cardiology has been rebuilt upon the work of a general practitioner, while orthopædic surgery has taken manipulative methods from the bone-setter to employ them in its everyday practice.

Medicine has never been more scientific in its training, more catholic in its scope, or more open in its judgment than at the present time. Honest heterodoxy has no difficulty in obtaining a hearing, nor, if it can prove a case, in securing adoption. Rather, I think, are we too easily wooed, too susceptible to the blandishments of the new. The last five years have seen many examples of this mistaken eagerness. Heterodox methods, honest enough and sponsored by men of repute, have been adopted and widely practised, only to be found worthless after an extended trial.

UNWISE ACCEPTANCE OF NEW METHODS.

The operation of lymphaticostomy, exposure and section of the thoracic duct in the neck after ligature of its junction with the subclavian vein with the object of draining away toxins and bacteria from the abdominal cavity, was introduced in 1923 for the treatment of septic peritonitis. The method appeared to hold out the promise of lessening a mortality that had remained undiminished, while that of other acute abdominal emergencies had been reduced tenfold; it was tried and failed, and the very reasoning upon which it was based was proved to be unsound.

A year later appeared the pioneer work of Hunter on the sympathetic innervation of striated muscle, and Royle's now classical papers upon the treatment of spastic paralysis by the operation of ramisectomy. No surgeon who read these remarkable articles doubted that a new weapon in the treatment of one of the most common and crippling diseases of childhood had been placed in our hands, and many adopted and practised the methods with sincere enthusiasm and confident faith. But faith soon wavered; enthusiasm gave way to doubt, and doubt to profound disappointment. The results obtained by orthopædic surgeons in every country except Australia and the outcome of cases operated upon by Royle himself in England and America have been disappointing; to-day the physiological basis itself of the operation stands discredited.

Periarterial sympathectomy was introduced by Jaboulay in 1899 for the treatment of perforating ulcers of the foot, but is more often associated with the name of Leriche, who has advocated it as a cure not only for gangrene but for chronic arthritis and many other conditions affecting the extremities. I may be premature in citing periarterial sympathectomy as another heterodox method which has been avidly accepted by our profession without sufficient scrutiny of its credentials, and has proved unprofitable; but I know no discriminating surgeon who, recovered from his delight at a few apparent successes, has persisted in the method, nor any disinterested investigator of series of cases who supports it. Further, the physiological investigations of Woollard make it clear that there is no logical reason why the operation should succeed.

PROGRESS THROUGH FAILURE.

Yet to Leriche and sympathectomy, and in far greater measure to Royle and the operation of ramisectomy, we owe the opening of a new page in surgical history which is only now being written—the surgery of the sympathetic system. Though valueless in the treatment of spasm in voluntary muscle, ramisectomy, and gangliomectomy which succeeded it, have proved very successful in the treatment of severe Raynaud's disease, and of occasional value in thrombo-angiitis obliterans—the results in this disease depending from the degree of vasomotor spasm in the unoccluded arteries; ganglionectomy has also given good results in Hirschsprung's disease.

Palliative Operations.

Disorders that arise out of the conditions of modern civilised life can only be treated palliatively, since their cause cannot be eradicated except by a return to barbarism, a step some might approve, but few would advocate. No group of diseases has evoked a greater number of suggested remedies or provided a readier opening for heterodox ones; for where successive methods have failed, unschooled enthusiasm is the more prone to grasp at any that are new and credible. I would mention more especially in this connexion the right-sided abdominal failures, intestinal stasis, coloptosis, cæcal distension, and all the troubles in the right iliac fossa for which the appendix is so often blamed without reason and removed without benefit. These are maladies of civilisation, maladies of early adult life, and preponderatingly maladies of women. They are the outcome of a failure of one or more of the many factors which combine to keep the large bowel working normally under normal conditions—factors mental, muscular, and dietetic. In their earlier stages, before organic changes have taken place in the colon, before its walls have changed their structure and lost their contractile power and become fixed in some faulty place or posture by adhesions, they can be alleviated and even cured by attention to these factors. Many require more radical treatment; the old mechanism is beyond repair and a new one must be constructed.

These chronic right-sided failures are very real problems, familiar to every practitioner and surgeon. The clinical picture which they present has been described by Lane with an accuracy and completeness that has left nothing to be altered or added by subsequent writers. But the record of their treatment by operation must give cause for profound dissatisfaction to any thinking surgeon. Probably more fortunes have been made and reputations lost in this field than in any other.

OPERATIONS ON THE COLON.

The operations which have been described and practised for the treatment of right-sided colonic failures are many, but they fall, roughly, into two categories—those of fixation and those of excision. Both are attractive, for they appear to get to the root of the trouble, and operations of each type have been widely accepted and even incorporated into orthodox teaching; both are equally unsound. The operations for fixation are wrong because they run counter to the general orthopædic principles governing the action of hollow muscular tubes—that they must be free to alter their position and diameter as waves of peristalsis pass along them. The primary fault in this group of diseases is not a failure in fixation, but a failure in propulsive power in the wall of the colon. Wide variations in the attachments of the large bowel, both in the direction of greater peritoneal fixation than the average type and of incomplete fixation, are found in the fœtus and demonstrated by radiography and at laparotomy in individuals who have never had any symptoms attributable to their presence. Failure is due to a deficiency in tone both in the wall of the colon itself and in the postural tone of the abdominal wall which supports the viscera; and while this deficiency may react earlier and to a more marked degree upon those individuals in whom the peritoneal attachments of the bowel are incomplete or abnormal, it will cause trouble sooner or later in all. Where tone is deficient, no artificial methods of fixation will hold the colon against its tendency to prolapse; indeed, by interfering with the wall of the bowel such operations are more likely to hinder still further its propulsive power and convert it into a passive bag dragged down by contents which it cannot expel. The occasional successes of colopexy are due less to the operation itself than to the careful régime and re-education of the abdominal muscles which has succeeded it. Failures are prevalent.

Far more disastrous are the failures of colectomy. For as long as five years after the operation the patients may improve, but after that period they deteriorate steadily, till finally they present the picture of habitual ill-health, a warning to all of us that we cannot scrutinise too jealously the basis of any procedure that is presented to us before we finally admit it to orthodoxy. Complete colectomy is dead; in its time it has probably done more harm than any experiment in the history of surgery. Hemicolectomy remains, but it is only slightly less disastrous. In so far as these operations remove a damaged and useless structure, they are well-founded, but in so far as they destroy the normal mechanism of digestion, they are unscientific. Intestinal digestion is controlled by the ileocæcal sphincter in a precisely similar manner to that in which gastric digestion is controlled by the pylorus. The sphincter remains closed till intestinal digestion is complete, the while movements of segmentation mix up the chyme, and absorption of digestible matter continues. After some few hours the sphincter relaxes, admitting what remains into the cæcum; this residue contains a minimum of nutritive material. By colectomy this natural mechanism is abolished. The contents of the small intestine, as yet undigested, pour into the remaining colon, and their value is lost to the body; the putrefactive bacteria of the colon enter the ileum where they find abundant material in which to multiply, and where their toxins are readily absorbed, owing to the abundant blood-supply and specialised absorptive function of the mucosa in this region. In the loss of the ileocæcal valve can be found the explanation of the ill-results of colectomy.

Removal of an unhealthy colon is justifiable in the more severe type of case, but the degenerative changes which have been described are usually most marked in, or limited to, the proximal colon, where the evils of stasis are intensified by the action of gravity. Total colectomy is, therefore, an unnecessary sacrifice of useful tissue, and hemicolectomy is preferable. But the destruction of the mechanism of digestion can be justified on no grounds but the necessity to eradicate a focus of cancer. The symptoms which follow on the operation—anorexia, sleeplessness, anæmia, loss of weight, and nervous instability—all point to a condition of chronic intoxication, which cannot be relieved, nor its further progress arrested. Three of these chronic right-sided failures have come into my hands within the last year; patients in whom all medical measures, carefully ordered and conscientiously executed, had failed to give any relief. In these three patients I have performed a new operation suggested by Dr. A. F. Hurst—hemicolectomy, with transplantation of the ileocæcal sphincter, carrying its nerve- and blood-supply intact, into the transverse colon. The effect of this operation is to leave an alimentary canal in which intestinal and colonic digestions are still segregated by the normal sphincteric mechanism, but in which the damaged colon has been removed, leaving a large intestine healthy, of sufficient length, and aided throughout by gravity. The immediate results in these three cases have been excellent.

Unjustifiable Heterodoxy.

Closely allied to the subject of honest but mistaken heterodoxy is that of stupid heterodoxy—the introduction of new ideas that are merely the resuscitation of former failures, or are based upon wrong or insufficient reasoning. In my reference files I have a folder, the "Chamber of Horrors," in which communications of this nature are kept. One surgeon describes a case in which he performed ileocolostomy, closing both ends of the large intestine, and reports that the colon slowly distended till it occupied the greater part of the abdomen, and the patient finally died; no one who had read the chapter on exclusion in any text-book of operative surgery would have performed this operation, or, having performed it, would have parted with the secret. Another writes of the operative treatment of fractures, illustrating his thesis with radiograms showing all the faults against which Lane cautioned his hearers in 1910. A third publishes a new operation for gastric ulcer, which is none other than the old one of gastro-jejunostomy with entero-anastomosis, which was abandoned at the beginning of the present century because it was followed so frequently by jejunal ulceration, and which stands condemned by the recent experimental work of Mann.

SURGERY OF THE STOMACH.

It is in the subject of gastric operations that callow heterodoxy is most rife, for the stomach will stand almost anything and almost any operation will do good for a time. I would suggest that all those operations that aim at making an anastomosis between the stomach and the duodenum—gastro-duodenostomy, side to side or end to side, pyloroplasty, Finney's operation, duodenectomy, Billroth I gastrectomy, and Schœmaker's gastrectomy—are based upon unsound physiology and are unprofitable in practice.

Two arguments support them—that the new opening is at the site of the pylorus, and that the food leaving the stomach enters that part of the small intestine that is most used to the presence of an acid medium. The first ignores the essential fact that the pylorus is a sphincter acting under nervous control and that, if it be destroyed, no stoma, wherever placed, can assume its functions. Such a stoma is an artificial opening, emptying mechanically, and that stoma will be best which can be made most easily and perfectly in every case and which remains free to move with the movements of the surrounding viscera and the contractions of its component parts. The pyloric end of the stomach and first part of the duodenum are poor surgical material, thick, friable, and vascular; they must be mobilised for approximation, and are pulled from their natural line and under tension after suture; they are not readily controlled by clamps. When an anastomosis is made between them bleeding is troublesome at the time, leakage is not uncommon afterwards, and the finished operation is seldom a really satisfactory craftsman's job.

The second argument is no more than an unsupported statement. The chyme, after leaving the stomach, hurries with great rapidity through the duodenum and upper loops of the jejunum, so that there cannot be any appreciable difference in the reaction of the contents of the first few feet of intestine below the ampulla of Vater. Recent evidence suggests that recurrent ulceration is as common, or more common, after gastro-duodenostomy than after gastro-jejunostomy, and the results less satisfactory. The older operations of posterior gastro-jejunostomy and the Polya type of gastrectomy have a sounder basis, satisfy more nicely the demands of the surgeon-craftsman, and yield results that are as good as any in surgery.

Heterodoxy and Originality.

Since an enlightened medical public is so willing to embrace any new doctrine which is placed before it with the appearance of sincerity, heterodoxy may prove an easy way to notoriety, if not to fame. The reformer and the revolutionary are heterodox. We are, therefore, prone to accept the converse proposition—that heterodox opinions denote the reformer. Those who would acquire an easy reputation for originality need only trade upon this common fallacy, to be certain of a considerable following. Such spurious heterodoxy may be entirely unscientific and frankly dishonest, as cheiropractic, or the Abrams box. It may be of questionable scientific parentage and of doubtful honesty, as is the case with rejuvenation and some of the surgical cures for deafness More often the method is sound enough and honest enough, and only the proprietary relationship of its sponsor is in question. As in the world of industry, the patentee often dies unhonoured while some commercial magnate waxes rich upon the proceeds of his invention, so in science when advances are made the glory and the profit of them goes to him who is first in the market-place. Within the last few years the injection treatment of varicose veins and the renewed public interest in radium have provided such opportunities for the more alert to adopt methods in whose origin they had no part, to write about them in season and out of season, in the medical press and in the *Times*, to rise from overdrafts to affluence, and from comparative obscurity to international reputations.

Heterodoxy is the expression of initiative, ambition, originality, energy; a native orthodoxy the outcome of the reverse qualities. The heterodox mind craves for individual employment, with the chances of fresh fields to conquer, for victory or glorious failure; the orthodox mind seeks safety, a settled future, regular hours, and a certain reward. Therefore, specialisms are founded by the heterodox, but recruited from the orthodox; after the first generation they tend to become mutual admiration cliques, and to lapse into impenetrable standardisation. They decay. The strata of geology are loaded with the remains of extinct specialists who concentrated all their energies on adapting themselves to one particular aspect of their environment; the environment changed and they, being unable to fit themselves to new circumstances, have perished and given way to a stock that meets conditions as they arise.

Specialisation is of the greatest value to surgery, not because each branch studies some small subject with greater intensity, but because each brings a fresh outlook, a new school of surgical thought, which can be applied with benefit to the rest of the art. Plastic surgery has raised the ideal of meticulous care in the handling of tissues; orthopædic surgery stands not so much for the correction of deformity as for a vision dominated by the study of physiology and the respect of function. Such specialisms are born in the vision of some man, or group of men. They rise, like waves upon the ocean, because some driving force raises the matter around it for a time above the surrounding level; like waves, they should agitate the common body while they are moving and be taken back into its substance when the driving force is spent. Every surgeon should study the leaders of plastic surgery and return to his own work kindled with a new vision of technical perfection. The gospel of orthopædics should animate more than the surgery of crippledom. For specialisms that remain apart tend to a dead and static perfection, having the semblance but not the reality of advance, like waves on the sand of the desert.

The Ideal Attitude.

And now I would return to the main subject of my discourse. Fashions change, but truth is eternal, and what has been accepted by successive generations must be founded upon truth. Therefore, the main body of surgical science and thought is orthodox, and heterodoxy concerns rather the form of its expression. To quote Sir Thomas Browne: "There is yet, after all the Decrees of Councils and the niceties of the Schools, many things untouch'd, unimagin'd, wherein the liberty of an honest reason may play and expatiate with security and far without the circle of an Heresie."

Nor need we be ashamed of our orthodoxy, for orthodoxy accepted for purposes of smooth working indicates a stable and reasoned organisation. The good surgeon is orthodox in his teaching and his public utterances; heterodox in his innermost conscience. Text-books must be orthodox; monographs should be heterodox. We should only beware of an orthodoxy that is accepted without thought and without question, for that indicates an extinct faith.

The fetters of orthodoxy are ready to close round all of us, especially if we work at a teaching hospital. We cannot feed the young upon those untried enthusiasms that mean more to us than all the books in our library, for the ideas which we teach them now, however true they may be, however acceptable to future generations, must pass the scrutiny of the most orthodox of mankind—the examiners in surgery. We are happy if we can keep our faith while we serve as priests in the house of Rimmon. Orthodoxy is with us everywhere—at public discussions, at the meetings of our surgical associations, at the annual gatherings at which we congregate. It is only after the tumult and the shouting have died, when the captains and kings of surgery have departed in their expensive cars and some of the younger spirits gather round cocktails, that men really speak their mind on surgical topics. Here lies the great value in the advancement of surgery of the small and intimate clubs, like your clinical society, for it is in the exchange of theories labouring for expression, the outpouring of enthusiasms as yet inarticulate to a fellow-enthusiast, that new ideas are born.

A barge making its way up the Thames from London to Oxford does not proceed at a uniform rate. At times it is moving forward; at times it remains stationary in a lock; but while it is in the lock, water is flowing in from the higher streams, till finally a new level is reached and a fresh advance is possible. Thus, by alternate pause and progression, it finally mounts to the highest levels. So the advance of knowledge must be wayward: the locks are periods of orthodoxy; the advances, of heterodoxy.

For guidance we have the advice of St. Paul: to prove all things and hold fast that which is good. And the spirit of this counsel should pervade our attitude to surgery; the spirit, and not the letter, for if we try all things, we will do a great deal of harm to our patients in finding that which is good. Ingenuity, courage, and unconventionality are admirable qualities in a surgeon so long as they are not practised on others. Therefore, before we try any new idea, we must first ask ourselves: "Is it reasonable? Has it a scientific basis? Is it safe enough to try on a patient, or should I first try it on myself, or in the laboratory? Has it, or anything similar, been done before, from which I can judge the chances of success or failure? If it has failed in the past, was failure due to a fault inherent in the method, or because some factor making for safety or success was unknown to the man who carried it out?"

If the answers satisfy us, we may proceed to practical tests: if these tests confirm our faith, we must still convince our fellows. We shall have our reward if we have been able, even in small measure, to add to the heritage of orthodox surgery.

THE TREATMENT OF FUNCTIONAL ANOREXIA.

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Loss of appetite is a symptom commonly met with in ill-health. Thus there is, to quote examples, generally a distaste for food in the acute stages of a febrile illness, at an early stage in cancer of the stomach, also in chronic renal disease, alcoholism, and advanced tuberculosis. Anorexia is, however, not always a symptom of organic disease. It may occur as a primary and often the sole complaint in persons who are simply "run-down" in health or in others who are passing through acute anxiety or mental or physical strain. Lauder Brunton[1] noted the bad effect which financial worry has on the digestion and appetite of business men, and in these days of industrial depression such influences require no stressing. In young women, again, a disappointment or an emotional shock is often the starting-point of a failure of appetite. Those engaged continually in the preparation of food for others and leading an indoor life are also apt to lose their appetite and suffer accordingly. To the type of anorexia which is not necessarily associated with organic disease the term "functional" may be applied.

Functional anorexia is usually mild and temporary, but in the more persistent forms it may be overlooked by relatives and friends alike until the signs of obvious undernutrition appear. This is because the patient may not complain, and is either unaware of the failure of appetite or seeks to hide it. If unrecognised, it may progress to the condition known as "anorexia nervosa," a name first applied by Sir William Gull[2] to describe three cases in young women who showed distaste for food, profound emaciation, and cessation of the menses. This happily rare complaint, which was also early recognised by Lasègue, has since been described by many writers, notably Dejerine and Gauckler,[3] Sollier,[4] Nathan,[5] Lyon,[6] and Venables.[7] Though it is amenable to treatment, a fatal issue is not unknown, and Elliott[8] has reported the results of autopsy in two cases in each of whom the body-weight at death was under 4 st. The findings showed that death had resulted from starvation, the tissues being denuded of fat.

To whatever cause it may be due, it is evident that persistent loss of appetite will lead in time to undernutrition. The energy needed, not being sufficiently supplied by the diet, is supplemented by the gradual using up of the bodily reserves of fat, glycogen, and protein. In a well-nourished fasting subject 87 per cent. of the total energy is derived from the breaking-down of stored fat and only 13 per cent. from the tissue protein (Lusk[9]). Later, when the fat reserves have been exhausted, protein metabolism is increased. Though total abstinence from food cannot be borne for long, partial starvation can be endured for an almost indefinite period, the duration depending on the initial weight of the patient, the daily expenditure of energy, and the character of the food eaten. Many writers have commented on the extraordinary energy displayed by the subjects of functional anorexia. Clifford Allbutt[10] drew a vivid picture of a young woman "whose daily food might lie on a half-crown piece," who was "busy with mothers' meetings and with what you please else of unselfish effort, yet on what funds God only knows." This feature may be related to the findings of Hassin[11] who studied the effects of famine on Russian peasants. He was struck by the absence of structural changes in the nervous system, even in the presence of extreme emaciation.

Material for Consideration.

This paper is based on the experience gained from 20 cases of functional anorexia treated in the past five years at Ruthin Castle. In all, organic disease has been excluded by preliminary physical examination and testing of the blood, urine, and fæces. In many cases, where the possibility of an obscure underlying physical disease could not be excluded, further investigations were made, such as fractional gastric analysis, X ray examination of the alimentary tract, and estimation of the basal metabolic rate and sugar tolerance.

In Table I. the results of physical examination are summarised. Seven cases (Nos. 4, 9, 10, 11, 15, 17, 20), belonged to the anorexia nervosa type and showed almost complete loss of appetite, emaciation, and amenorrhœa. The lowest weight in the series was 4 st. 6 lb. in a subject (Case No. 17) whose height was 5 ft. 3 in. The average weight for a woman of her age and height would be 9 st. In the more severely undernourished cases the skin was dry and parchment-like, and subject to bruises on prominent parts and patches of eczema. The extremities were cold and blue and the temperature was generally subnormal with a slow pulse. The systolic blood pressure was below 100 in five cases, below 120 in 12, and in none was it above 140 mm. This lowering of blood pressure is in accordance with the findings of Cathcart[12] and Rostoski,[13] who noted a similar fall in starving subjects. Inquiry into the questions of sex, age, and civil state showed a preponderance in females (19–20), and in single persons (16–20), and the average age for the series was found to be 33.

TABLE I.

Case	Sex and age.	Civil state.	Height.		Weight.		Menses	B.P.	Pulse-rate.	Temp.
			Ft.	*In.*	*st.*	*lb.*				
1	F. 36	S.	—		8	2	N.	90/60	68	98·4°
2	F. 32	S.	5	10¾	7	9	Irreg.	104/76	72	97·6°
3	F. 49	S.	5	3	6	0	N.	120/60	68	97·4°
4	F. 37	S.	5	6	7	0	Am.	120/80	54	98·2°
5	F. 41	S.	5	9	7	10	N.	105/86	66	98·0°
6	F. 41	M.	5	7¾	7	3	N.	100/85	48	97·8°
7	F. 42	M.	—		7	12½	N.	120/90	62	97·4°
8	F. 29	S.	5	9¾	9	5	—	126/92	60	97·6°
9	F. 30	S.	5	5	5	3	Am.	90/70	64	98·0°
10	F. 20	S.	—		6	2½	Am.	106/90	72	98·2°
11	F. 21	S.	—		5	8	Am.	110/60	70	97·2°
12	F. 32	M.	5	6	7	8	N.	80/70	68	97·6°
13	F. 29	S.	—		8	0	N.	115/90	66	98·0°
14	F. 53	S.	—		5	10	N.	140/70	98	98·2°
15	F. 29	S.	5	5	7	2	Am.	70/50	70	97·6°
16	M. 20	S.	5	10	10	9	—	125/80	76	97·8°
17	F. 25	S.	5	3	4	6½	Am.	92/66	60	98·4°
18	F. 39	M.	5	6	8	11	N.	136/92	68	97·0°
19	F. 39	S.	5	4	6	8	N.	118/80	72	98·2°
20	F. 23	S.	5	7¾	6	2½	Am.	125/75	60	97·2°

Am. = amenorrhœa.

Notes.—Case 2.—Masculine build. 3. Emaciated; energetic. 4. Emaciated. 6. Cold extremities. 8. Eczema of face. 9. Emaciated; bruising on legs. 10. Emaciated. 11. Cold extremities. 17. Very emaciated; energetic. 20. Emaciated; dry irritable skin.

Preliminary Observations.

Mild and temporary forms of functional anorexia respond readily, as a rule, to simple methods of treatment. A short holiday and freedom from domestic duties is often all that is required to restore the jaded appetite of a tired housewife. A bitter tonic before meals and daily outdoor exercises are required for others. The 20 cases which have been selected in this instance had not, however, responded to home methods and had been referred for hospital treatment. When there is persistent anorexia with loss of flesh it is generally advisable to separate the patient from home and relatives. Once away from the influence of over-anxious parents and the home atmosphere a patient may do well if put on an ordinary full diet, and in many of the cases treated no other steps were necessary. In other cases the loss of appetite persists even after removal to hospital, and in these more specific methods are required.

In many cases inquiry will elicit a history of a shock, anxiety, or disappointment which preceded the loss of appetite. Whenever possible difficulties should be adjusted, but only too frequently the circumstances are such as may not be readily altered. Often, too, the anxiety or shock is in the past, and the patients have sunk into a state of indifference or carelessness. They are probably suffering from the effects of prolonged semi-starvation as much as anything. Improvement in nutrition and the passage of time will therefore play an important part in restoring the lost balance. Though, in this paper, the physical aspect of the problem is considered more in detail, it is not intended to ignore the all-important and—in anorexia nervosa—ever-present psychological aspect. Psychotherapy will play an important part in treatment and success will depend largely on the degree to which the patient will coöperate with the doctor. The confidence of the patient must be secured in the early days and care must be taken to do nothing subsequently which would alienate goodwill. Detailed psycho-analysis has been given a careful trial, but is not, in our experience, needed or advisable.

A few days should be spent before active treatment is commenced in studying the character and extent of the anorexia. A patient may state that she cannot eat large quantities of food. When, however, the amount is reduced the same tendency to leave a part uneaten persists, and of average-sized meals from half to two-thirds, as a rule, is left uneaten. There is frequently a dislike for certain types of food, such as eggs, milk, potatoes, or puddings, and a fondness for others, usually of much lower nutritive value, such as fruit, salads, tea, and coffee. In cases of persistent anorexia with steady loss of flesh it is an advantage to know how much food is actually eaten when the patient is left to her own devices. For three consecutive days, therefore, a note is kept of the quantities given at the various meals and the amount left untouched after the meals. The caloric value of the food eaten can then be calculated. In Case No. 20 the weight on admission was 6 st. 2½ lb. and the height 5 ft. 7¾ in. The average weight for a woman of this height would have been 9 st. 8 lb. This patient was therefore 47½ lb. under weight. Loss of appetite had followed a period of overwork for an examination and weight was being lost at the rate of about 1 lb. a week. The diet was measured for three days. Had all the food been eaten the value of the diet would have been 1900 calories, but as almost half was left uneaten the value of what was ingested was about 1000 calories. On this meagre diet the patient was doing a full day's work, with inevitable loss of flesh.

Dietetic Treatment.

In considering this an analogy may be drawn with the treatment of obesity resulting from excessive appetite. It is, of course, no more necessary to fast a person in order to lose flesh than it is to overfeed another to gain it. The obese subject must have the diet reduced and take more physical exercise. The undernourished subject must increase the amount of food eaten and reduce the expenditure of energy. If this is reduced to a minimum very little increase in the diet may be required. Prolonged fasting in the obese often produces ill-effects and, similarly, if undernourished subjects are grossly overfed a violent reaction may occur, with indigestion, loss of confidence, and further depletion of weight. In treating obesity the diet may be made as bulky as possible by the use of soups, vegetables, &c., which, whilst appeasing hunger, have a negligible food value. Conversely, in functional anorexia it is permissible to make the diet as small as is compatible with the necessary requirements. The object of treatment is twofold: to improve the nutrition of the patient in the hope that this may result in a more healthy state of the appetite, and to stimulate the lost appetite by various methods.

IMPROVEMENT IN NUTRITION.

Reduction of expenditure of energy.—The patient should be kept in bed at first in a warm room with a temperature of about 60° F. When patients are in bed, sitting up for meals and reading, the arms and shoulders are often exposed. These should be covered by a warm jacket or cardigan, with long sleeves extending to the wrists, to minimise loss of heat. Part of the afternoon should be spent completely at rest, the patient lying down and sleeping if possible.

Difficulty may be met at first with the more energetic patients in achieving these ends, but as a rule they quickly settle down. Getting up may be allowed later, and the time for this will depend on the results. Indeed, the prospect of it is often a valuable incentive towards eating the required increased amount of food.

Increased diet.—According to the formula of Du Bois the basal requirements can be calculated from W. 0·425 × H. 0·725 × 71·84 (W = weight in kg.; H. = height in cm.). In giving the surface area in square metres by a reference to the tables worked out by Du Bois and Gephart,[14] calories per square metre per hour can be obtained; 25 calories per kg. in 24 hours should be supplied for an average patient. In the Case (No. 20) mentioned above, the weight was 6 st. 2½ lb., or approximately 42 kg. The amount of food required to maintain basal equilibrium was therefore about 42 × 24 = 1000 calories. Actually the patient was eating slightly less than this and doing a full day's work. In such a case the diet should be led on to 1500–2000 calories while the patient is resting in bed.

In arranging a suitable diet for a patient suffering from functional anorexia all appearance of bulk should be avoided, the food being rather in concentrated form and as appetising as possible. Some foods, such as roast pork, salmon, and sausage, though highly nutritious, often prove indigestible, and when this is so should be avoided. The relative values of an ounce of each of some of the common foodstuffs is given below for comparison. The figures given are those in use at Ruthin Castle, many being from food analyses made by Mr. A. J. Leigh, B.Sc.

	Calories.		Calories.
Dripping, suet ..	270	Roast beef or mutton ..	87
Olive oil	248	Egg, boiled	80
Butter	227	Cream	77
Nuts—brazil, almonds, walnuts ..	208–212	Cooked chicken or duck .	68
Grilled bacon	155	Boiled potato	28
Cheese (Cheddar) ..	117	Milk pudding—rice, sago	27
Bread, toasted	93	Boiled sole, cod	26
		Milk	19

The foods which are largely composed of fat (bacon, cheese, lard, butter, nuts, olive oil, and cream) have the highest value, since a gramme of fat yields 9 calories of heat as compared to the 4 calories yielded by a gramme of protein or carbohydrate. Tea and coffee have no food value; soups, salads, vegetables, and fruit a low one. The worth of these in a diet can, however, be increased by the indirect use of fat-containing foods. Thus cream may be advised in preference to milk in tea or coffee. Soup is also improved in flavour by the addition of cream. Cream and sugar are usually taken with stewed fruit, and vegetables are rendered more appetising by the use of butter in cooking. Most people prefer toast to bread, and this is an advantage because, weight for weight, having less water, toast contains more nourishment. Boiled potatoes may be improved by mashing and mixing with cream and butter. The resulting "potato cream" has a high caloric value.

Below is given a sample diet of about 1500 calories made up largely on the above lines. In arranging a suitable diet for an undernourished subject with a poor appetite, it is not necessary to weigh the quantities unless the case is a severe one and there is doubt whether enough food is being taken. As a rule, in the milder cases the necessary amounts of food can be gauged roughly by experience alone.

Solid food is, as a rule, more difficult to take than liquid, and when there is difficulty in increasing the diet it may be supplemented by certain nourishing and yet palatable drinks. In the treatment of our cases these have played an important part, and there are three which deserve mention.

1. *Marlin's mixture* is prepared by mixing equal parts of cornflour, milk, and lactose and stirring; 8 oz. of this mixture has a food value of about 500 cals. The drink is best given in two equal portions some time in the forenoon and at bedtime.

2. *Orange-juice.*—This is prepared from the fresh juice of oranges mixed with an equal quantity of water to which glucose is added. A pint of this will take 150 g. of glucose and the juice of six oranges; the value is about 800 cals. The jug is left by the bedside and the juice may be drunk with meals or at intervals during the day or night. It has an agreeable clean flavour and is readily taken.

3. *Barley-water.*—This consists of barley-water to which glucose and a little lemon-juice have been added. When flavoured with lemon 30 g. of glucose can be contained in one pint and the value is about 120 cals.

DIET OF ABOUT 1500 CALORIES.

		Oz.
Breakfast.		
Two slices of toast; one pat of butter; egg scrambled with butter. Tea with cream, sugar.	Toast	=1
	Butter	= ½
Lunch or Dinner.		
Roast beef or mutton; cabbage cooked with butter; a small milk pudding made with an egg; one slice of toast, butter.	Toast	= ½
	Butter	= ½
	Beef	=1
	Cabbage	=2
	Rice	=1
	Egg	=1
	Milk	=6
Tea.		
Tea with cream, sugar, three slices of bread and two pats of butter.	Cream	=1
	Bread	=1½
	Butter	= ½
Dinner or Supper.		
Tomato soup (about 6 oz.) to which cream is added. Fish, potato, cream, stewed fruit with cream and sugar. One slice of toast with a pat of butter and a little cheese.	Cream	=3
	Fish	=1
	Potato	=2
	Butter	= ½
	Fruit	=3
	Toast	= ½
	Cheese	= ½

After a start has been made with the diet such as has been described, of about 1500 calories, the addition of one of the above will bring the value up to about 2000 calories, which is more than ample for a person lying in bed. Attempts may then be made to increase gradually the amounts of solid food taken. As far as possible the increase should be almost imperceptible. The patient is weighed weekly but no comment is made except that progress is favourable. It is undesirable that a patient should be aware one week that she has not gained weight and equally undesirable that she should think that with the gain of 1 or 2 lb. efforts may be relaxed. In a severely undernourished person who is practically refusing food it may be necessary to insist on the food being eaten by being present at meal-time. This was only required in a few cases.

IMPROVEMENT IN APPETITE.

This usually occurs gradually as weight is gained, but its return may be encouraged in the early stages by a variety of measures.

Bitter tonics and acid.—The drugs most frequently used to promote appetite are the bitter tonics and particularly gentian and strychnine with dilute hydrochloric acid. The prescription which was most used in our cases was tinct. nucis vomicæ ♏ 5, ac. hydrochlor. dil. ♏ 10, glycerini ♏ 30, inf. gent. co. ad. 1 oz. An ounce of this was given before meals thrice daily. It is rational to suppose that those cases which show subacidity of the gastric juice are most suitable for treatment with acid; seven of the 20 cases had subacidity when examined with a fractional test-meal. Boas,[15] writing on the value of bitters in the treatment of anorexia, states that they are not of much value in prolonged cases but do good in cases where there is temporary failure of appetite. This is in accordance with our own experience, and we have found them more useful in the milder types and in the more severe cases after a start has been made.

Insulin.—Since its introduction in the treatment of diabetes insulin has also been used to promote appetite. Many writers have reported their experience of it in the treatment of anorexia. Among these may be mentioned Vogt,[16] Falta,[17] Appel, Farr, and Marshall,[18] Levi,[19] Short,[20] Moutier,[21] and Frank. Vogt and Falta noted that it improved the general as well as the carbohydrate metabolism. Appel and Farr treated 33 undernourished psychotic patients who were complaining of loss of appetite. Of these 16 were males, and the average gain per week was 3 lb. Thirteen were females, and with dieting alone they gained about a pound a week. With insulin in addition they gained an average of 2½ lb. a week. These authors stressed the necessity for careful supervision, as three of their patients developed severe hypoglycæmia. The dose they used was from 10–40 units daily. Short reported seven cases of loss of appetite successfully treated, but noted that the effects of insulin in improving the appetite wore off after a time. He advised ten units half an hour before meals. Moutier obtained good results with insulin in nine of 23 cases. He began with five units twice a day and increased the dose to 20–30 units.

In many of the present series of cases sugar-tolerance tests were performed during the preliminary investigation; 60 g. of cane-sugar were given on a fasting stomach, first thing in the morning, the patient resting in bed and the blood-sugar being estimated at half-hourly intervals by Hagedorn's method. The blood-sugars were within the normal range in all the cases, but in some tolerance appeared to be slightly decreased (Cases 10, 11, 13), whilst in others (Cases 8, 20) it was slightly increased. In these two cases with a low range of blood-sugar it appeared likely that insulin might be dangerous. The figures are given as follows:—

Case	Resting	Blood-sugar: Hours.					Result.
		½	1	1½	2	2½	
1	1·10	0·10	0·16	0·12	0·11	0·11	Normal.
2	0·08	0·11	0·13	0·15	0·08	0·07	„
8	0·07	0·11	0·10	0·10	0·10	0·08	Increased.
10	0·11	0·15	0·20	0·16	0·11	—	Decreased.
11	0·09	0·16	0·20	0·21	0·18	0·12	„
13	0·09	0·17	0·15	0·20	0·14	0·14	„
16	0·08	0·12	0·18	0·15	0·16	0·12	Normal.
18	0·07	0·16	0·18	0·14	0·10	0·10	„
20	0·08	0·10	0·08	0·08	0·08	0·06	Increased.

Insulin was used to promote appetite in six cases. The results obtained were not striking. In some there was no appreciable result; in others a sense of weakness or emptiness followed the injections. In none was a pleasant sense of appetite produced. The doses given were small, from 3–10 units twice daily, the usual being five units. It is possible that better results might have been achieved with larger doses, but the experience in one case (No. 9) was sufficiently alarming to discourage higher dosage.

This patient was suffering from anorexia nervosa and weighed 5 st. 3 lb. She had been having insulin in doses of five units before breakfast and five units before dinner. After a week she was found one afternoon in a state of hypoglycæmia with symptoms of severe collapse, feeble pulse, cold extremities, and extreme mental apathy. Glucose by mouth and per rectum and a subcutaneous injection of adrenalin ♏ 5 relieved the symptoms.

The best results were obtained in patients who were not severely undernourished and who were already improving with diet alone. After three or four weeks the appetite often showed a tendency to flag, and it was then that insulin appeared helpful, in small doses given for a short period such as a week or a fortnight. After that its effect appeared to wear off.

Thyroid.—Thyroid has been used as a means of promoting appetite. Lévé gave small doses of the extract by the mouth to women suffering from functional anorexia and observed that the appetite returned and the weight increased. In starvation there is a lowering of the basal metabolism, and Benedict,[22] experimenting with students on a reduced diet, noted an average fall of from 101 to 88·5 per cent. in six weeks. The conditions in functional anorexia are akin to those of semi-starvation, and Moeller[23] found in four cases of this kind a fall in proportion to the degree of under-nutrition. Estimations of the basal metabolic rate were made in nine cases. In only two, however, was the result below 90 per cent. Both of these (Nos. 9 and 15) were much undernourished and suffering from anorexia nervosa. In emaciated subjects with an intense anorexia it is probably undesirable to increase metabolism artificially unless one can be sure that an adequate quantity of food will be eaten. With a persistent anorexia such a procedure would only hasten the loss of flesh. The extract may be tried, however, with safety in half-grain doses twice a day at first in patients of the milder sort with a slow pulse and lower basal metabolic rate who can be persuaded to eat.

Gastric lavage.—Gastric lavage is of value in the treatment of chronic gastritis resulting from alcoholism, renal disease, or benign pyloric stenosis. Improvement in appetite and gain in weight result. Tixier[24] has found it helpful in the anorexia of infants and young children. In the functional anorexia of adults there is often a complaint of fullness after meals. In seven cases of this series (Nos 2, 4, 9, 12, 13, 14, 20) the stomach was found to be dropped and relaxed, whilst a seven-hour gastric residue was present in one case (No. 13). Though it is unpleasant at first, patients rapidly accustom themselves to gastric lavage and learn to do it themselves. The best time is about 6 P.M. The residues of the day's food are then washed out with a warm solution of bicarbonate of soda, about a teaspoonful to the pint, and the stomach is left empty to receive the evening meal. During the night the stomach has again a chance to empty, so that emptying occurs at least twice in the 24 hours. In three cases in which this method was employed, improvement in appetite resulted, and one case (No. 20) gained 26 lb. over a period of several months during which the treatment was carried out by the patient herself. Lavage may be given daily at first and after a time thrice a week; later it is reserved for occasional use as required.

Periodic Fasts.—The practice of fasting dates back to the earliest times. The first symptom which fasting produces is hunger. In experiments with rats, Pembrey and Spriggs[25] noted that when an animal was fed after a fast there was a rapid increase of weight, the previous hunger apparently acting as a stimulus to the assimilation of food. These observations confirmed those of earlier workers, such as Seeland, Barfurth, and Noé.[26] Though fasting has been used as a therapeutic measure in many diseases, we have not met with references to its possible value in the treatment of loss of appetite. In the past year six cases have been treated by this method on Dr. E. I. Spriggs's suggestion. The impression gained is that it is a valuable means of promoting appetite and gain of weight. It is applicable to all grades, from the mild variety to the more severe type of anorexia nervosa. Moreover, patients who are struggling with their appetites enjoy a periodic rest, and are more willing to eat the prescribed amounts of food on the following days.

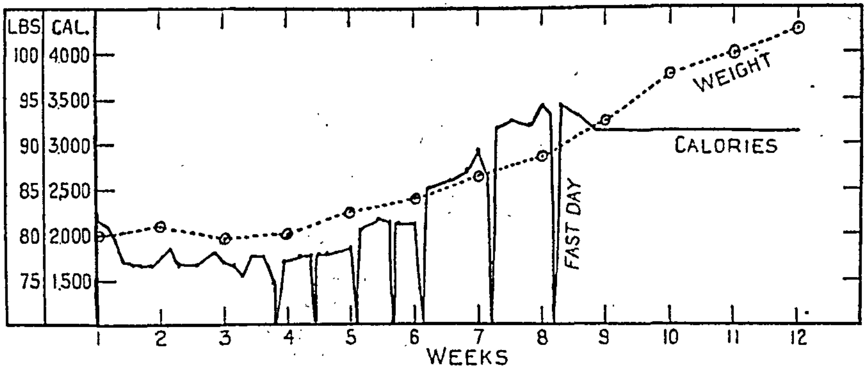

Chart showing a gain of 23 lb. in weight under treatment by rest in bed, dieting, and periodic fasts.

Treatment is begun with a "fast" day. No solid food is taken but water may be drunk, and half a pint of orange juice, prepared in the manner described above (400 calories), is left by the bedside. On the next three days a diet of about 2000 calories is given. On the fifth day there is another fast, and so on with three days' full diet and one day's fast. Thus in a week there are two fast days at first. As appetite improves, only one fast day is given a week, and later fasting is reserved for occasional use only. The patient is, of course, kept in bed on fast days as well as on other days at first, but later getting up may be allowed on the full diet days. An example is given below to show the benefit which may result from periodic fasting.

The patient, a woman (Case 14), weighed 5 st. 10 lb. and complained of loss of appetite and tiredness. She was persuaded with difficulty to eat a light diet which had an average value of about 1500 calories. Resting in bed she gained weight slowly: 4 lb. in just over a month. Fast days were then given. The actual figures are arranged below for comparison over a period of ten consecutive days.

Persuasion. Day.	Caloric value.	*Periodic Fasts.* Day.	Caloric value.
1	1,750	11	Fast (490).
2	1,600	12	2,300
3	1,530	13	2,250
4	1,630	14	2,430
5	1,620	15	1,700*
6	1,630	16	2,410
7	1,530	17	2,830
8	1,680	18	Fast (380).
9	1,040	19	2,850
10	1,570	20	2,420
Total	16,180	Total	20,060

*Half-day fast.

After the first fast the appetite improved and more food was eaten on the succeeding three days. Before it began to flag again another short fast was given. The figures show that even with two whole days' and one half-day's fast more food was eaten than on the previous ten days without fasts. At the end of a month on this régime 9 lb. weight had been gained as compared with the 4 lb. gained in the preceding month without fasts.

Results of Treatment.

In Table II. the results of treatment are set out. It will be seen that, of the 20 cases treated, 16 responded to treatment and did well, recovering their appetite and nutrition. The remaining four cases did not improve. They were treated some time ago and their present state is known. The first (Case 1), a single woman aged 36, had lost her appetite after the death of her mother and an operation on the abdomen. She was profoundly depressed throughout and would have lost weight through lack of food had she been left to herself. As it was, with the most strenuous efforts at persuasion, she held her weight but did not gain, and left in much the same state. After this she was treated in a nursing home and in a hospital for nervous diseases without improvement. Her present state two years later is much the same as then. In this case the mental state of depression dominated the picture. The second case was an energetic married woman of 42 (Case 7). Her energy expenditure was much in excess of the small amount of food she ate and she resented interference with her diet. In every way she appeared to be very well except that she had no appetite, and she also is in much the same position two years later. The third case was similar to the second and occurred in a young married woman of 29. The fourth case (No. 9) has been about 5 st. 3 lb. for years. In both the third and the fourth cases there appeared to be an element of mental deficiency.

Of the 16 cases which did well, success in restoring appetite and nutrition seemed to depend on: (1) the gaining of the patient's confidence; (2) the degree of

TABLE II.

Case No.	Weeks of treatment.	(a) Weight on admission (b) on leaving.	Weight gained.	Rate per week approx.	Type of treatment.	Results.
		st. lb.	lb.	lb.		
1	15	(a) 8 2 (b) 8 2	0	0	Dieting.	Unchanged.
2	3	(a) 7 9 (b) 7 12	3	1	Dieting and P.F.	Imp. A. and N.
3	7	(a) 6 0 (b) 6 8	8	1	Dieting.	,,
4	8	(a) 7 0 (b) 8 1	15	2	,,	Recovery.
5	16	(a) 7 10 (b) 8 5	9	½	,,	Imp. A. and N.
6	12	(a) 7 3 (b) 8 2	13	1	Dieting, P.F., and insulin.	,,
7	5	(a) 7 12½ (b) 7 5½	0	0	Dieting.	Further loss of flesh.
8	6	(a) 9 5 (b) 9 13	8	1	,,	Improved.
9	16	(a) 5 3 (b) 5 5¾	¯2¾	0	Dieting, G.L., insulin.	Unchanged
10	12	(a) 6 2½ (b) 7 11½	23	2	Dieting.	Recovery.
11	10	(a) 5 8 (b) 7 8	28	3	,,	,,
12	9	(a) 7 8 (b) 8 2	8	1	Dieting, G.L., insulin.	Improved.
13	16	(a) 8 0 (b) 7 11¾	0	0	Dieting, G.L.	Unchanged
14	16	(a) 5 10 (b) 7 7	25	1½	Dieting and P.F.	Recovery.
15	12	(a) 7 2 (b) 8 4½	16½	1½	Dieting and insulin.	,,
16	3	(a) 10 9 (b) 10 12	3	1	Dieting.	Improved.
17	12	(a) 4 6¾ (b) 5 7¾	15	1	Dieting and P.F.	,,
18	9	(a) 8 6 (b) 9 4	12	1	,,	Recovery.
19	5	(a) 6 8 (b) 7 11½	9½	2	Dieting.	,,
20	12	(a) 6 2½ (b) 8 0	25½	2	Dieting and P.F., insulin.	,,

P.F. = periodic fasts. G.L. = gastric lavage. Imp. A. and N. = Improved appetite and nutrition.

mental stability; and (3) the coöperation of the parents, so that time was allowed to obtain the necessary result. The optimum period of treatment for a case of severe anorexia or anorexia nervosa appeared to be about three months. In this time 1–2 st. could be gained and appetite recovered in most cases. As a rule the greatest increase of weight was made by the most undernourished patients. Of the different methods used, including dieting, insulin, gastric lavage, and bitter tonics, the best results seemed to follow the practice of periodic fasts and increasing the diet after the fast days. The method has the advantages of being free from risk and acceptable to the patient. The accompanying graph represents the progress made by a patient on this régime, the curves showing the gain in weight and the diet in calories with fast days.

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HEART-BLOCK FOLLOWING ACUTE APPENDICITIS.

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THE following case seems worth recording because heart-block is an extremely rare sequela of appendicitis, and because electrocardiographic tracings were obtained at frequent intervals illustrating the rapid sequence of changes which occurred.

Record of the Case.

The patient, a man aged 41, was admitted to Addenbrooke's Hospital on Sept. 4th, 1930.

For five years he had had attacks of pain in the abdomen at infrequent intervals. These had not lasted more than a few days, and he had not taken very much notice of them. In all other respects he had been perfectly healthy. He had never had any symptoms suggestive of acute rheumatism or syphilis, and his family history was good. Two days before admission he had been seized with severe pain in the right iliac fossa, associated with vomiting and constipation, and on admission he was seen by Mr. W. H. Bowen, who diagnosed acute appendicitis.

Operation was performed at once and an acutely inflamed appendix removed without difficulty. There was no sign of gangrene or perforation, but flakes of lymph were present on its peritoneal surface and on the adjacent omentum. After operation progress was uneventful until Sept. 8th. The temperature, which was 101° F. on the day after operation, subsided gradually. The wound appeared quite healthy, and there were no other signs or symptoms during this period.

On Sept. 8th the patient did not feel quite so well, but nothing abnormal was noticed. On the early morning of the 9th the *pulse* became slightly irregular, and appeared to be dropping beats. At 6 A.M. he felt dizzy and complained of abdominal discomfort, but this was ascribed to an aperient which he had been given. On the morning of the 10th the pulse was quite irregular, the rate was slower than it had been (72), and at times several beats appeared to be dropped. The patient on the whole seemed better and was beginning to eat well.

On the 11th, at 3 A.M., the pulse suddenly became very poor and irregular, and the patient became pale and collapsed and perspired freely. He complained that he felt a terrible sinking sensation in his chest and a sense of impending disaster, although there was no actual pain. These sensations gradually passed off and the pulse improved.

I was first asked to see him at 10 P.M. on the same day. He was then still rather pale and collapsed. The pulse was of good volume, and regular but for one or two missed beats in every minute. The rate was 72. The heart did not appear to be enlarged, and the sounds though faint were otherwise normal. There was no evidence of arterial disease in the optic discs or elsewhere. The blood pressure was 110/75. The only other symptoms were a slight pain in the right shoulder which had come on the day before and might easily have resulted from lying in one position, and acute congestion of the vessels of the right side of the conjunctiva, which had also come on the day before. The wound seemed to be perfectly healthy.

At 10 A.M. on the morning of the 12th the condition was unchanged except that the pulse-rate was slower (45), and dropped beats were more frequent. At times the rate would drop to 30 for five or ten consecutive beats. By 4 o'clock in the afternoon the pulse-rate was never above 35, and occasionally it was 24 for periods of a minute or more. From this point the clinical condition of the patient improved steadily, and the pulse-rate gradually quickened. On the morning of the 13th the rate had risen to 70, and no dropped beats could be detected on clinical examination. Apart from the variations in rate no abnormal physical signs were detected in the heart at any time, and by the 15th the patient was feeling quite well, and the blood pressure had risen to 140/90. The first electrocardiogram was taken at 10 A.M. on the 12th, and then once or twice daily until the 17th. The tracing on the 17th was normal but for a P–R interval of 0·28 second, and on the 20th was quite normal.

A teleradiogram taken one month after the onset of the attack showed no enlargement of the heart. The Wassermann reaction was negative.

Treatment.—During the acute phase of the attack and for 14 days afterwards the patient was kept at absolute rest. Morphia was given six-hourly from the 11th to the 13th, and after this gradually stopped. Return to normal activity was graduated, and the patient was allowed to resume work as a signalman ten weeks after the onset of the heart symptoms.

Heart-block in Infections.

Cases of transient heart-block are met with in the course of various infections, but are most frequently associated with acute rheumatism. In this condition they are by no means uncommon. Parkinson, Gunson, and Gosse,[1 2] in an analysis of 50 consecutive cases of acute rheumatism, found a P–R interval greater than 0·2 sec. in 11 cases. Some degree of block persisted for periods of from 1 to 18 days, but had disappeared before discharge from hospital. Four of these cases had dropped beats, and in one a 2 : 1 block was present which lasted for two days. Cohn and Swift[3] made a similar study in 37 cases, and found that the P–R interval was prolonged in eight, with dropped beats in one. Bain and Hamilton[4] in 50 cases found a prolonged P–R interval in two. White[5] described a case in which acute partial heart-block was one of the initial signs of onset of rheumatic fever in a boy of 18. Before any signs of acute rheumatism had appeared the a–c interval was found to be 0·5 sec., and beats were dropped. Four days later, when typical signs of rheumatic fever had appeared, the a–c interval was still prolonged, but six weeks later it had become normal. Other cases of heart-block in acute rheumatism are reported by Butterfield,[6] Naish and Kennedy,[7] Cowan, Fleming, and Kennedy,[8] Cowan, McLeod, and Paterson,[9] Christian,[10] Lewis,[11] Mackenzie,[12] Peabody,[13] Esmein, Pezzi, and Donzelot,[14] and Routier.[15]

Partial heart-block is occasionally met with in diphtheria. Marvin and Buckley[16] have collected nine proved cases from the literature, and added two more to these. In these cases onset was from the third to the twenty-first day of the disease, and was followed by death in all but one case. Post-mortem examinations done in some of these revealed extensive changes in the myocardium, with profound damage to the conducting system. The one case which survived, recorded by Parkinson,[17] developed complete heart-block, which was followed by auricular fibrillation which persisted.

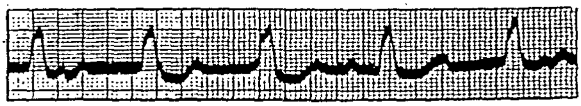

FIG. 1.—10 A.M., 12 × 30. Partial heart-block and intraventricular block. Q R S 0·12 sec. In this and subsequent figures the vertical lines are 1/5 and 1/25 sec., and lead II. alone is shown.

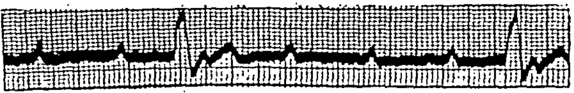

FIG. 2.—4 P.M., 12 × 30. Partial heart-block up to 4 : 1. Q R S 0·12 sec.

More rarely heart-block is met with in other infective conditions. Lewis[18] mentions that it occurs in pyogenic infections, influenza, typhoid, scarlet fever, and pneumonia, and mentions a case of transient partial heart-block from a case of subacute cystitis[19] resulting from an infection by an organism of the coli group, and a case of temporary heart-block in pneumonia. Mackenzie[20 21] mentions cases in influenza, septic poisoning, and puerperal fever; Magnus-Alsleben temporary heart-block in pneumonia[22]; Wenckebach a case in influenza[23]; Jellinek and Cooper[24] a fatal case in a patient with acute gonorrhœal sepsis in which autopsy revealed anæmic necrosis in the region of the bundle of His; James[25] a fatal case during the course of streptococcal septicæmia, in which autopsy revealed an ulcer in the intramuscular septum. Recorded cases with instrumental confirmation of the severer grades of heart-block during the course of infections other than rheumatism are, however, uncommon. Probably some of the attacks of bradycardia noted in such infections are due to transient attacks of heart-block similar to the present one.

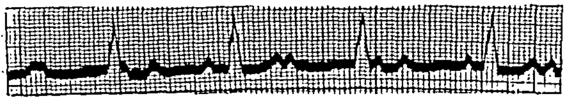

FIG. 3.—10 A.M., 13 × 30. Partial heart-block 3 : 2. Q R S 0·1 sec.

The happy result in this case leaves the cause a matter for speculation.

CAUSE OF THE BLOCK.

There appear to be two ways by which heart-block could have been brought about. The conductivity of the bundle of His may have been lowered by poisons absorbed from the infected appendix. This seems very unlikely, because not only was the main source of infection removed four days before the first sign of heart involvement appeared, but the slight signs of general toxæmia which were present at operation subsided steadily, and there did not appear to be more than slight local inflammation in the vicinity of the wound after operation. Further, any signs and symptoms which were present came on too rapidly and cleared up too quickly to have been associated with any gross general damage to the muscle of the heart, and to explain it in this way such a poison must have had a selective action on the conducting tissue. A more likely explanation is that a mild bacteriæmia was associated with the subsiding local inflammation in the appendix region, and caused a small focal inflammatory lesion in the region of the bundle of His which interfered temporarily with conduction. Possibly the pain in the right shoulder and the inflammation in the right conjunctiva may have been due to similar focal lesions. Such lesions have been described by Cowan,[26] who regards them as incidents in a general pyæmia. The larger lesions are generally found in septic infections and the smaller in cases of pneumonia, small-pox, enteric fever. They may be compared to the focal inflammatory lesions found in the muscle in acute rheumatism which have been described by Aschoff,[27 28] and Coombs.[29 30]

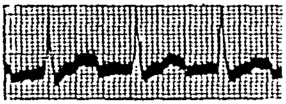

FIG. 4.—10 A.M.; 14 × 30. No dropped beats. P–R 0·32, Q R S 0·08 sec.

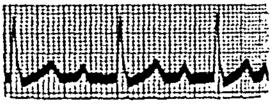

FIG. 5.—15 × 30. P–R 0·23 Q R S 0·08 sec.

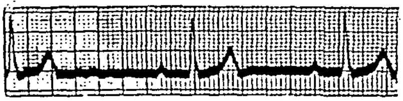

FIG. 6.—17 × 30. P–R 0·28. Q R S 0·06 sec. Slow sinus rhythm.

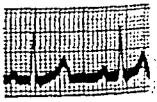

FIG. 7.—26 × 30. P–R 0·16. Q R S 0·06 sec.

The occurrence of such a chain of symptoms after appendicitis is an interesting clue to the way in which an acute infection, other than rheumatism, may lay the foundation of myocardial disease. Had the conducting tissues not been affected in this case, the signs of cardiac involvement would probably have been so slight that they would have escaped notice.

In conclusion, I should like to thank Dr. Ffrangcon Roberts for the radiological examination in this case.

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SULPHUR, TURPENTINE, AND ALEPOL INJECTIONS

IN PERSISTENT PSYCHOSIS.

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IT has been frequently observed in the insane that intercurrent febrile illness may cause striking amelioration of the mental symptoms. Patients have been observed to improve or even recover after acute infections such as erysipelas, typhoid fever, or acute pyogenic disease. The treatment of general paresis by induced malaria is an example of the therapeutic application of this phenomenon. Yet it remains a mystery how this amelioration is effected. It may be that the production of phagocytes and antibodies is stimulated, and some hidden source of chronic bacterial toxæmia is dealt with; or the stimulation of metabolism may increase oxidation and hasten elimination of toxic waste products from the cortex and body generally; or the exposure of the brain cells to a supernormal temperature may exercise some specific influence. Another theory is that the improvement is psychogenic in origin, attributable entirely or partially to the pain or discomfort experienced and the extra attention and nursing involved. These factors will tend to focus the patient's attention upon reality, and compel him to some degree of extraversion.

Three Remedies.

In this investigation three substances known to cause a bodily reaction were selected for trial, and an attempt has been made to assess their therapeutic value in cases of persistent psychosis. The bodily defence mechanism, as evidenced by leucocytosis and the thermal reaction, was observed with the object of discovering whether a relationship exists between those physical phenomena and the mental effect produced. In assessing the value of any new therapeutic agent, it is essential that the patient selected for treatment by the new means should first be given a fair trial with ordinary therapeutic measures. Otherwise, cases which would have recovered with ordinary routine treatment, or spontaneously, would be included in the number of successes claimed for the new treatment. Especially is this true in cases of psychosis, where recovery is often unexpected or spontaneous. Apart from a small number of those treated with turpentine, all the cases have resisted, for at least six months, the usual standard treatment of the mental hospital—rest, open air, dieting, tonics, regulation of habits, and correction of physical disorders.

SULPHUR IN OLIVE OIL.

K. Schroeder[1] claims favourable results in the treatment of dementia præcox by means of Sulfosin, a 1 per cent. solution of sulphur in olive oil.

A series of 21 cases was treated by us with injections of a 1 per cent. solution of sulphur in olive oil. The solution was made by rubbing up the required quantity of the purest flowers of sulphur with pure olive oil in a mortar and placing the suspension in a hot oven until all had dissolved. The resulting sterile solution was put up in ampoules. The injections were given in increasing doses, commencing with 1 c.cm., and increasing each time by 1 c.cm. They were given at approximately five days' intervals. One case was treated entirely with sulfosin Leo (Copenhagen), while four other cases received two injections of sulfosin Leo and three subsequent injections of our own product. The general immediate effects, the pyrexia and the leucocytosis, did not differ whether sulfosin Leo or our own product were used.

The injections were made intramuscularly in the gluteal region, and only a few of the patients complained of pain. After four hours the temperature rose one degree, remained up for two or three hours, and then returned to normal. This initial rise of temperature was accompanied by a little nausea. After a variable period of from 10 to 16—or even 18—hours from the injection the temperature began to rise, usually reached 101° F., and seldom exceeded 103° F. The time during which the patient remained fevered was very variable; sometimes only seven hours, occasionally as long as 20 hours, probably depending on the rate of absorption as well as on the particular patient's reactivity to sulphur. The pyrexia was accompanied by a leucocytosis (about 20,000 white cells per c.mm.). The number of injections varied from three to ten. Generally it was found that the sixth injection (6 c.cm.) produced the greatest reaction, in a few cases producing a hyperpyrexia of 105° F. When the fever was present some nausea was complained of, and when there was hyperpyrexia actual sickness usually occurred. After the injections the leg was a little stiff, but no lasting pain, tenderness, or other disability resulted.

The diagnoses in the cases treated may be summarised as follows: katatonia, 1; schizophrenia 6; post-schizophrenic dementia, 5; melancholia, 5; manic-depressive psychosis, 1; recurrent mania, 1; hypochondriacal neurasthenia, 1; and paraphrenia, 1.

Recovery took place in one case of recurrent melancholia. The patient was a woman, aged 45, whose outstanding symptoms were agitated depression and suicidal tendencies. She was ill for nine months before admission to hospital and for six months afterwards. During this time she had improved a certain amount, but for some months before the treatment her condition had remained unchanged. She recovered after four injections of sulphur.

Seven cases could be regarded as improved. The diagnoses in these cases were: katatonia, 1; katatonic schizophrenia, 1; involutional melancholia, 3; hypochondriacal neurasthenia, 1; and paranoid schizophrenia, 1. In none of these cases, however, was improvement marked, and in five of them it occurred some months after the treatment. In two

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of the cases the psychological effect of the injections was obviously a factor in causing the improvement.

The results are disappointing; this form of treatment seems to be of very limited value in the psychoses.

TURPENTINE.

Pascal and Davesne[2] give an account of the treatment of 257 cases by means of turpentine producing sterile abscesses, and claim very encouraging results. They used a mixture of one part of turpentine of Venice and five parts of oil of turpentine, and injected it into the deeper layers of the subcutaneous tissue of the antero-lateral aspect of the thigh.

In this investigation the same technique was followed. Fifteen cases were given turpentine alone and seven other cases received a subsequent course of T.A.B. vaccine intravenously, the vaccine being administered as the temperature reaction due to the turpentine was subsiding. The amount injected varied from 1·5 c.cm. to 2 c.cm., the former dose as a rule being given to females and the latter to males.

The diagnoses in the cases treated may be summarised as follows: schizophrenia, 9; mania, 2; melancholia, 5; manic-depressive psychosis, 1; paraphrenia, 1; general paresis 1; acute confusional insanity, 2; and post-schizophrenic dementia, 1.

In this series the bodily reaction, as evidenced by the local reaction, leucocytic reaction, and degree and extent of pyrexia, could not be correlated with the mental response. It did not necessarily follow that, because the physical reaction was a severe one, there would be a marked improvement in the mental sphere.

Some hours after the injection the patient complained of pain and itching at the site, and in about 12 hours the temperature commenced to rise and a red brawny swelling appeared. Symptoms increased in intensity for three days and the swelling became fluctuant. The average extent of the swelling was six inches by five. In a few cases a much more extensive and diffuse reaction occurred, affecting the whole outer aspect of the thigh. In two-thirds of the cases the abscess underwent spontaneous absorption, while in the remainder incision and drainage were necessary. The pus was a thin brownish hæmorrhagic fluid containing tissue debris, turpentine globules, and leucocytes. The temperature gradually subsided and returned to normal after a period varying from 3 to 13 days. The pus was examined and found to be sterile. In all cases the patient was confined to bed, and the routine treatment of fever carried out during the acute stage. A little lameness was noticed for a few days after, but no permanent disability resulted.

Only in two cases was the treatment entirely devoid of beneficial effect. They were similar cases, suffering from a severe type of melancholia, with restlessness, suicidal impulses, and such agitation that it rendered them inaccessible. In them the effect of the injection seemed to be merely an increase in their load of misery. No ill-effects were observed except in one patient who was given 2·5 c.cm. of turpentine. A marked, though transient, albuminuria was produced. No impairment of kidney function resulted, but this indicates that it is inadvisable to give more than 2 c.cm. of turpentine at one time. A second injection may have a marked beneficial effect after the failure of the first. In no case did we observe the reactivation of the inflammatory process, at the site of the first injection, described by Pascal and Davesne.

The general impression given by the investigation is that the claims put forward by Pascal and Davesne are unduly optimistic, but that in selected cases the production of sterile abscesses by means of the injection of turpentine is quite a potent therapeutic agent in the psychoses. In an acute recoverable benign type of illness the good effect of the turpentine is potent enough to accelerate the natural process, and thereby perchance it may at a critical moment turn the balance in the patient's favour. In the chronic malignant type of psychosis, a good effect is obtained but the course of the psychosis is not essentially altered. For example, one patient suffering from paraphrenia, who was a very resentful, idle, noisy, uncoöperative person, has become quieter, and is now an active willing ward-worker. Her delusional system is unaltered, and she is still noisy and resentful at times. Again, a general paretic, who was quite unmanageable and taxed the resources of the nursing staff to the utmost, became a pleasant, amenable patient. The subsequent course of T.A.B. vaccine was of no additional value.

ALEPOL.

Alepol is a preparation of sodium hydnocarpate used in the treatment of leprosy by Sir Leonard Rogers. A 3 per cent. solution was made, and injections of it were given intramuscularly, commencing with a 1 c.cm. dose. Injections were given twice weekly, increasing the dose by 0·5 c.cm. each time until a dose of 5 c.cm. was reached. Alepol is said to be the active principle of chaulmoogra oil, and it was considered worthy of trial.

Five cases were treated: two of post-schizophrenic dementia, two of hebephrenic schizophrenia, and one of paranoid schizophrenia. Nine injections were given to each patient, and in one case there was slight improvement.

In each case a white count was performed before, during, and after the course of alepol. The general effect was to produce a mild leucocytosis not exceeding 16,000 white cells per c.mm. We are of opinion that no beneficial effect was produced by this treatment.

Discussion.

On reviewing the results as a whole, no correlation can be found between the physical disturbance produced and the mental changes. A marked and constant increase in the white corpuscles is produced by sulphur in oil, a moderate increase by turpentine, and a slight increase by alepol. Despite the fact that sulphur in oil is capable of stimulating a vigorous reaction of the leucocytes, it does not produce a corresponding mental improvement. Examination of the turpentine series shows that the degree of leucocytosis is not proportionate to the mental improvement; and augmentation of the leucocytosis by means of T.A.B. vaccine has absolutely no additional therapeutic value. Thus, stimulation of the defence mechanism of the body as indicated by leucocytosis, is not the essential factor in effecting mental improvement, and the application of the term "leucogenic shock" to turpentine therapy is undesirable.

In sulphur we have an excellent agent for the artificial induction of pyrexia but, as stated above, little beneficial effect accrued from its exhibition. In the turpentine series no relationship was found between the degree and extent of pyrexia on the one hand and the mental improvement on the other. Although T.A.B. vaccine is a powerful agent for production of pyrexia, its administration was a failure from the therapeutic point of view.

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[2] Traitement des Maladies Mentales par les Chocs.

Increase of nursing attention is not an essential factor, as patients suffering from acute confusional insanity, who are already receiving constant attention, may show a striking response to the injection of turpentine.

In our opinion pain is the most important psychological factor in the improvement, although it cannot be denied that the extra attention and care bestowed on the patient do cause improvement by keeping him more closely in contact with his environment.

CONCLUSIONS.

1. Sulphur in oil is of limited value as a therapeutic agent in cases of persistent psychosis. Alcpol is of no value. Turpentine has a limited value in selected cases.

2. Pyrexia and leucocytosis are not in themselves sufficient to cause mental improvement. Hence it appears that the amelioration of the mental symptoms, which occurs in psychotics who contract intercurrent febrile illness, is due to some other factor or factors. The psychological factor undoubtedly plays a part, but we do not feel that it is the entire explanation. Probably the stimulation of metabolism, by oxidising and eliminating toxic waste products, is an important factor.

We desire to express our thanks to Dr. Easterbrook, physician-superintendent of Crichton Royal, for valuable advice and criticism, and for permission to publish these results.

SCLEROSIS OF THE PULMONARY ARTERY WITH THROMBOSIS.

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Four main groups of diseases of the pulmonary artery are generally recognised:—

(1) *Congenital* (usually stenosis, but occasionally dilatation of the pulmonary arteries).

(2) "*Primary sclerosis*," where there is no obvious cause. Several different lesions are included under this name. Usually the walls, and especially the intima, of the small branches of the pulmonary artery are thickened and the lumen narrowed, and there is also atheroma of the larger branches. Probably the cases described by Rogers[16] in India should be put in this group, as the evidence of a syphilitic origin would not now be thought sufficient. In Veale and Coombs's[18] case in a child of 5 there were lesions resembling atheroma. Clarke's[5] Cases 3 and 4 showed similar lesions, though the microscopical appearances were rather anomalous. Clarke suggests that, as these lesions are sometimes found in children, the condition is due to an inborn deficiency of the material of which the pulmonary arteries are made.

(3) *Syphilitic disease* which may occur alone or together with other syphilitic lesions such as syphilitic aortitis, or, according to Arrillaga[1] and others, syphilitic bronchitis. There are two main types of lesion: (*a*) syphilitic endarteritis or panarteritis of the small branches, usually associated with atheroma of the main branches, and (*b*) lesions of the main branches closely resembling syphilitic mesaortitis. In such cases aneurysms may occur. Sometimes both types of lesion are combined. Although syphilitic pulmonary artery disease is rare, the literature seems to be concerned chiefly with this type of case.

(4) *Secondary sclerosis*, occurring in cases in which the pulmonary blood pressure is thought to be raised, such as fibrosis of the lungs, emphysema, and mitral stenosis. This is by far the commonest group, but it has attracted very little notice.

CLINICAL PICTURE.

The best known clinical syndrome of pulmonary artery disease is often called Ayerza's disease. The patient is usually middle aged and has suffered from cough and dyspnœa for many years. At this stage he presents the clinical picture of chronic bronchitis with emphysema. After many years the previously slight cyanosis increases until the complexion is almost black (hence the term *cardiacos negros*) and the dyspnœa also increases, though usually not in proportion to the cyanosis. Hæmoptysis is common and, according to Laubry and Thomas,[13] may occur before the development of extreme cyanosis. It is then, in the absence of evidence of the usual causes of hæmoptysis, said to be a valuable early symptom of syphilis of the pulmonary artery. Polycythæmia is present. The right side of the heart is enlarged, and X rays show dilatation of the pulmonary artery. After two to five years in this stage the patient dies of heart failure, with or without œdema. Autopsy shows lesions of the large and small branches of the pulmonary artery, interpreted as syphilitic. The lungs show chronic bronchitis and emphysema, and the right side of the heart is greatly hypertrophied. Arrillaga[1] thinks that a non-specific bronchitis, by increasing the strain on the pulmonary artery, localises the syphilitic process there, while Escudero[6] holds that in true Ayerza's disease the bronchitis is also syphilitic.

The clinical picture is obviously similar to that of heart failure secondary to chronic bronchitis with emphysema. The intense cyanosis, out of proportion to the other symptoms, has often been noticed. Escudero himself says that all cases of chronic lung disease with heart failure are very cyanosed and are therefore *cardiacos negros* but, in the absence of the typical syphilitic lesions in the bronchi and pulmonary arteries, are not cases of Ayerza's disease; while the lesions of Ayerza's disease may occur in patients who are not *cadiacos negros*. He says that Ayerza's disease can be distinguished from the heart failure of simple emphysema by the presence of polycythæmia and hypertrophy of the right side of the heart, a statement with which it is difficult to agree, since cyanosis of whatever origin may be associated with polycythæmia, and right heart hypertrophy is a commonplace in autopsies on cases of heart failure secondary to simple emphysema.

ÆTIOLOGY.

Although in some of the cases reported, such as those of Konstam[10] and Hare and Ross,[7] the pulmonary artery lesion is probably syphilitic, while in others, such as that of Warthin,[19] the syphilitic origin is proved by the discovery of the *Treponema pallidum* in the lesion, yet in many cases the part played by syphilis is very doubtful. In particular some French authors, such as Tremolières,[17] Caussade,[3] and Laubry,[11] have described cases in which endarteritis of the small branches of the pulmonary artery was found in patients with mitral stenosis and no clinical evidence of syphilis and in the one case where this was mentioned with a negative Wassermann. Syphilis was diagnosed because of the nature of the arterial lesions, though this alone seems inadequate, since endarteritis obliterans may occur in many conditions other than syphilis. In the following case there was very marked endarteritis of the smaller pulmonary artery branches in a case of mitral stenosis where there can be no reasonable suspicion of a syphilitic factor.

CASE 1.—A woman, aged 24, at her death in September, 1929, had her first overt attack of rheumatic fever at the age of 14. She became short of breath in 1925, and a little later her ankles began to swell. She became steadily worse until she was admitted to the Queen's Hospital under Dr. J. G. Emanuel in September, 1929. She was pale and somewhat cyanosed. There was great dyspnœa and marked œdema with ascites. The heart was regular and showed the signs of mitral stenosis. She died six days after admission.

Autopsy showed the body of a small poorly developed young woman, with marked œdema of the legs and ascites. The lungs were congested and œdematous. The main intrapulmonary branches of the pulmonary arteries showed fatty atheromatous patches. The heart weighed 420 g. and was greatly enlarged owing to dilatation of all the chambers especially the auricles, and hypertrophy of the ventricles, especially the left. There was a typical mitral stenosis, the orifice being reduced to a small slit. The aortic cusps were a little thickened, but the valve was competent. The aorta was narrow, and its intima was smooth and showed no lesion of any sort. There was no evidence of recent rheumatic infection. The organs showed chronic venous congestion.

Microscopically, the small branches of the pulmonary artery were greatly thickened (Fig. 1). There was much peri-arterial fibrosis. The media was rather thickened. The intima was greatly thickened and was often thicker than the media. It consisted of fibrillar, fairly cellular connective tissue, sometimes with multiplication of the internal elastic lamina. Some of the vessels were almost completely occluded. The medium-sized vessels showed similar but less marked changes, and the intimal thickening was less uniform. The lung tissue showed much peribronchial fibrosis. The alveolar walls were thickened and there was much catarrh of the alveolar epithelium. There were many areas of collapse with fibrosis and much proliferation of the alveolar epithelium. The appearances were suggestive of a chronic pneumonic process, perhaps of rheumatic origin.

Thrombosis of the Pulmonary Artery.

Thrombosis may occur in syphilitic aneurysms of the pulmonary artery, and is common in the small aneurysms frequently present in tuberculous cavities. It may also occur in syphilis of the pulmonary artery without aneurysm formation. Such cases have been described by Cheney [4] and Clarke.[5] Laubry and Thomas [12] describe a type of syphilitic pulmonary artery disease in which the symptoms from the onset are those of thrombosis with infarction. The thrombosis usually involves the small arterial twigs, but in McPhedran and Mackenzie's case[14] the larger branches were thrombosed, though here the syphilitic nature of the process was rather doubtful. Thrombosis of the small twigs may also occur in "primary sclerosis," as in Bacon and Apfelbach's case.[2] Occasionally pulmonary thrombosis is due to the invasion of the artery by tumour. In the case of a youth of 18 suffering from carcinoma of the testicle, with secondary deposits in the lungs, the branch of the pulmonary artery to the left lower lobe was plugged by thrombus. Microscopically, the artery wall was seen to be infiltrated by growth and many tumour cells were mixed with the thrombus in the lumen. It is noteworthy that this patient was pale, not cyanosed, and showed no special respiratory embarrassment. A rare form of thrombosis of small twigs in pneumonia has been described by Keefer.[9] The thrombosis causes areas of "aputrid pulmonary necrosis," which give the X ray appearances but not the symptoms of pulmonary abscess. Posselt[15] and Kauffmann [8] state that thrombosis is not very uncommon in pulmonary atheroma secondary to emphysema and mitral stenosis, and several examples of thrombosis of fine twigs have been recorded in the cases of endarteritis complicating mitral stenosis. Laubry and Thomas [11] attribute the hæmoptysis which is so common in mitral stenosis to thrombosis of small branches of the pulmonary arteries.

Thrombosis of large branches in cases of "secondary pulmonary artery sclerosis" seems not to have attracted much attention, and therefore the following cases seem worthy of record, especially as in one of them the thrombosis seemed to be the immediate cause of death.

CASE 2.—A woman of 58 had had a winter cough for years. For the last year she had become increasingly dyspnœic, and for a few weeks there had been increasing œdema of the legs. On admission she was very dyspnœic, cyanosed, and œdematous. The heart was enlarged (right border 2·7 and apex 4·5 inches from mid-line) and the lungs showed signs of chronic bronchitis and emphysema. She died six weeks *after admission*.

Autopsy showed the body of a fat woman with œdema of the legs. There were recent thrombi in the right femoral and left subclavian veins. The heart was enlarged (weight 530 g.) owing to hypertrophy and dilatation of the right ventricle. The valves were normal. The lungs showed chronic bronchitis and emphysema, with congestion and œdema. There was a large infarct in the right lower lobe. The main intrapulmonary arterial branches showed many patches of atheroma. The artery to the right lower lobe was almost completely blocked by pale adherent thrombus. The medium-sized vessels throughout the lung were extensively thrombosed. The other organs showed only chronic venous congestion.

Microscopically, the main artery to the right lower lobe shows change in all its coats. The adventitia shows hyaline fibrous thickening, with foci of lymphocytic infiltration. The media, except where it is thinned opposite the patches of atheroma, is of normal thickness. It shows much hyaline degeneration and its elastic fibres are much diminished in number, especially next to the intima. The intima is generally slightly thickened and shows numbers of typical atheromatous patches. The lumen is almost completely blocked by thrombus consisting chiefly of fibrin. The vessels of diameter 5–7 mm. show similar changes. Many contain old thrombus with early organisation (in growth of new capillaries and fibroblasts). The small arteries show perivascular fibrosis and hyaline intimal thickening, with narrowing of the lumen.

The pulmonary thrombus was obviously much older than that in the peripheral veins, so that it is improbable that it was of embolic origin. In none of the other cases was there any obvious source of embolism.

CASE 3.—A woman of 49 had had rheumatism in childhood. She had had a cough for years, with frequent slight hæmoptyses. For seven months she had been short of breath. She was fat, very dyspnœic, and cyanosed. The arms and legs were œdematous. The pulse was rapid but regular. The heart's apex was 7″, and its right border 2″ from the mid-line. There was an apical systolic murmur. The X ray showed a dense shadow in the lower half of the left lung field. She died a week after admission.

Autopsy showed the body of a fat œdematous woman. There were a few ounces of serous fluid in the pleuræ. The lungs were congested and œdematous, and showed chronic bronchitis and emphysema. There were hæmorrhagic infarcts in both lungs. There was a recent clot in the artery to the right lower lobe, and old adherent thrombus blocked the artery to the left lower lobe. The heart (weight 540 g.) was enlarged owing to hypertrophy and dilatation of both ventricles, especially the left. The myocardium showed patchy fibrosis. The mitral cusps were short, thick, and stiff, but the orifice admitted two fingers. There was marked coronary atheroma. The other organs showed chronic venous congestion.

Microscopically, the artery to the left lower lobe shows hyaline degeneration of the media and uniform hyaline intimal thickening, without atheromatous patches. The lumen is occluded by thrombus, old, fibrinous, and showing early organisation with the ingrowth of new capillaries at the edges; it is more recent in the centre. The small arteries show marked fibrous intimal thickening, with narrowing of the lumen. The lung tissue shows emphysema and congestion.

CASE 4.—A man of 58 was suddenly seized in July, 1927, with dyspnœa, which has persisted ever since. On admission in February, 1929, he was orthopnœic and generally œdematous. The heart's apex was 5½″ from the mid-line. Auricular fibrillation was present. There were signs of bronchitis, with blood-streaked sputum. He died four days after admission.

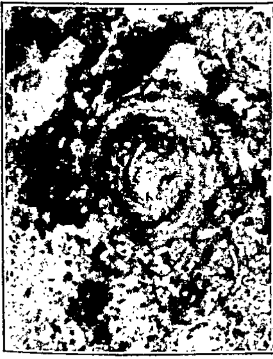
Autopsy showed moderate œdema of the legs and marked ascites. The lungs were congested and œdematous, and showed chronic bronchitis and emphysema. The pulmonary arteries were dilated, with many atheromatous patches and a little adherent clot in the main branches. The heart (weight 680 g.) was much enlarged owing to hypertrophy of both ventricles, especially the left. The valve cusps were normal, but the mitral and tricuspid rings were much dilated. The coronary arteries showed much atheroma. The other organs were congested.

Microscopically, the large branches of the pulmonary artery show typical atheroma. Some are completely blocked by thrombus, old at the edges, recent in the centre, and showing early organisation, with the ingrowth of new capillaries. A branch about 5 mm. in diameter, leading off from one of these, is blocked by organised and recanalised clot (Fig. 2). The small arteries show some intimal thickening.

CASE 5.—A man of 56 was admitted to the surgical side of the hospital with symptoms of carcinoma of the stomach. There was no note as to his chest condition, and no mention of cyanosis. He died two weeks later, without operation.

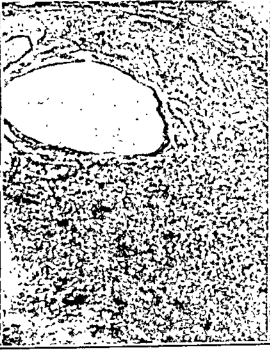
At autopsy, the lungs showed marked chronic bronchitis and emphysema. Near the apex of the right lower lobe was a small wedge-shaped area resembling an imperfect infarct. The pulmonary arteries were a little dilated and showed a few atheromatous patches. The branch to the left lower lobe contained a little ante-mortem clot. The branch to the right lower lobe was blocked by firm adherent thrombus. The heart showed little change. There was a diffuse carcinoma of the stomach.

FIG. 1.



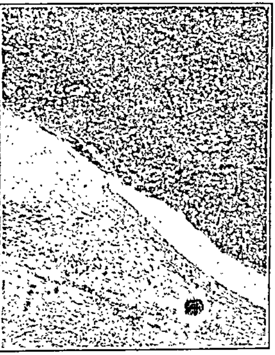
CASE 1.—A small pulmonary artery showing much intimal thickening and narrowing of the lumen. There is much pulmonary fibrosis. Stained with van Gieson and Weigert's elastic tissue stain. (×120.)

FIG. 2.



CASE 4.—Portion of a pulmonary artery 5 mm. in diameter, with lumen blocked by thrombus, most of which is converted into vascular fibrous tissue. Mallory's connective tissue stain. (×35.)

FIG. 3.



CASE 7.—Large pulmonary artery. Shows portion of an atheromatous plaque. Lumen blocked by thrombus which, over the patch of atheroma, is beginning to organise, as shown by the presence of numbers of capillaries. Mallory's stain. (×70.)

Microscopically, the large branches of the pulmonary artery show patchy atheroma, and many contain old thrombus showing early organisation with ingrowth of new capillaries. The small arteries show little change.

CASE 6.—A woman of 46 had had cough with blood-stained expectoration for 30 years, dyspnœa since 1915, and a sudden increase in the dyspnœa, followed by several large hæmoptyses, in 1921. On admission in May, 1928, she was orthopnœic, cyanosed, and very œdematous, with ascites and bilateral pleural effusions. The apex-beat was 4½" from the mid-line. There was an apical systolic murmur. Auricular flutter was present. She died on June 16th.

At autopsy the heart weighed 570 g. The left auricle was dilated and hypertrophied. The left ventricle was about normal in size; the right was very greatly dilated and hypertrophied, its wall being much thicker than that of the left. The mitral valve showed extreme button-hole stenosis. The pulmonary arteries were dilated and thick-walled, and showed many atheromatous patches. A thrombus about 1½" long, ¾" broad, and over ½" thick was present at the beginning of the artery to the right lower lobe, and greatly narrowed its lumen. Its surface was smooth, and it was very firmly adherent. It was evidently of very long standing.

Microscopically, many of the small branches of the pulmonary artery appear normal, but some show fibrous intimal thickening. No histological examination of the thrombus was made, as the lung was kept for a museum specimen.

CASE 7.—A man of 60, the hospital carpenter, had had chronic bronchitis for many years. For a few months he had been slightly dyspnœic on exertion. On the morning of Dec. 5th, 1928, he was much more dyspnœic than usual, but he went to his work at the hospital, where after an hour he "fainted." He was seen within ten minutes by the house physician on duty, who found him collapsed and pale, with a feeble but slow pulse. Half an hour later he was much better. His temperature was 96° F., his pulse-rate 70, and his respiration-rate 32. The pulse was feeble. The apex-beat was 4½" from the mid-line. There was never any cyanosis. He had four similar attacks during the day, and died in the last.

Autopsy showed the body of a thin old man. The pericardium was adherent to the front of the left ventricle. The heart (weight 370 g.) showed slight hypertrophy of both ventricles and dilatation of the right ventricle and auricle. The coronary arteries were atheromatous. There was no thrombus in the heart, and none was found in the peripheral veins. The lungs showed chronic bronchitis and great emphysema. The pulmonary arteries were dilated and atheromatous. The branch to the right upper lobe was blocked by firm adherent thrombus beginning about 2" above the origin and extending for about 2". The branch to the lower lobe was blocked for about 2" by firm adherent thrombus. The branch to the left lower lobe was blocked by a softer, smaller, and more recent thrombus which, however, was also adherent and obviously ante-mortem. The branch to the upper lobe contained only agonal clot.

Microscopically, the artery to the right upper lobe (Fig. 3) shows typical atheroma. The lumen is completely blocked by thrombus, old at the edges, more recent in the centre, showing early organisation with the ingrowth of new capillaries and fibroblasts. The small branches show comparatively little change.

Comment.

Several examples of endarteritis obliterans of the small branches of the pulmonary artery associated with mitral stenosis, such as occurs in Case 1, have been described in the French literature. In Case 1 there was no evidence of syphilis, and although most of the French authors attribute their cases to syphilis, they adduce no convincing evidence. In Case 1 there was a very marked chronic pneumonic process, possibly of rheumatic origin, and it seems not unreasonable to suggest that this was the local chronic inflammatory process which determined the occurrence of the endarteritis. It seems possible that the early death from heart failure with a normal rhythm might

NOTES ON THE CASES.

CASE 3.—This man complained of sexual impotence. He had been suffering from a recurrent anal fissure for many months. The cure of the fissure completely cleared up the impotence.

CASE 6.—This man had been unable to move except with great care for more than three years. In his last letter he says that at the age of 72 he now runs to catch an omnibus.

CASE 8.—There was a large hysterical element in this woman. Since her treatment she has had no acute pain, but she refuses to believe that the anus is now normal. As she seems to enjoy treatment she is being treated by an Abram's Box. In reply to a questionaire she says that she has no pain but is "conscious of her rectum." She has great faith that the Abram's Box will be of assistance, more especially as whatever local treatment she has is being enforced by "treatment directed towards the spleen!"

CASE 9.—This woman had previously been treated for internal hæmorrhoids by injections of carbolic in oil. She had found this treatment exquisitely painful. Whether it played any part in the later production of her fissure I am unable to say.

CASE 10.—This woman received no benefit from her first injection, and before the second injection I gave her a local injection of procaine and to some extent stretched the rectum with my fingers. I do not think that this divulsion, which obviously could only be lightly performed, played any part in the ultimate cure of the fissure.

CASE 13.—This man never had any pain until half an hour after defæcation. He then had acute pain for over an hour, and he had tried treatment by suppositories, ointment, and diathermy. One injection has led to his complete, and apparently lasting, cure.

It is hoped that in course of time more reports will be published on the effect of this method. It is only when many more reports are to hand that we shall be able to say whether it will hold the field. Meanwhile it is permissible to stress once again the pain which anal fissure can cause. Although, perhaps, in the majority of cases this is short-lived, in some cases it will last for seven or more hours, and will vary in its intensity from a local ache, always described as resembling toothache, to an excruciating agony. Such a small local lesion can affect not only physical activity but, if left untreated, gives rise to chronic constipation, general ill-health, and neurasthenia. Like the injection treatment of hæmorrhoids the treatment here advocated is ambulatory, and, carefully performed, has no contra-indications.

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CLINICAL AND LABORATORY NOTES

AN UNUSUAL CASE OF TETANUS.

BY T. H. G. SHORE, M.D. CAMB., F.R.C.P. LOND.,
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IN the case here related tetanus toxin gained access through an inoculation site within the cavity of the nose, and consequently the symptoms were of the type described as cephalic or hydrophobic tetanus, but with certain modifications. There was never any real question of hydrophobia, though the possibility crossed one's mind at an early stage. Inability to swallow was due simply to pharyngeal spasm without any actual horror, and salivation was absent.

The patient was a boy, aged 3, the son of a publican, who was brought to Mr. C. S. C. Prance on account of difficulty in swallowing. He had been running about and playing as usual until the day he was brought, though the difficulty had been developing gradually for four days. During this time slight twitching of the right side of the nose and mouth had been noticed. There had been no complaint of sore-throat.

When first seen the child was extremely nervous and resented any examination, but trismus was at once observed making it impossible to examine the throat. On admission to a nursing home the temperature was 99·2° F. and the pulse-rate 134. The right palpebral fissure was smaller than the left; the pupils were equal and reacted normally. There was some rigidity of the neck, which, however, was easily overcome. Tendon reflexes were all very brisk, but were equal on the two sides. There were no enlarged lymph nodes in the neck, and nothing on which to comment in the condition of the heart, lungs, or abdominal viscera. The urine was free from albumin throughout. The throat and nose were examined under an anæsthetic, and a crust was removed from the right nostril. Though nothing else was found cultures were made which proved negative to diphtheria. During induction of the anæsthetic the child had a severe convulsion with general rigidity and cyanosis.

On the following day generalised spasmodic convulsions were easily provoked, during which the teeth were firmly clenched, the arms, legs, and back became rigid, the head was retracted, and the position of opisthotonos was assumed. The chest was fixed in the inspiratory position and cyanosis became extreme. The tongue was bitten once and flatus was passed, but never urine. After two or three minutes the spasm passed off, air was admitted to the chest, and cyanosis abated, but some degree of rigidity remained. The risus sardonicus was present. One such convulsion occurred during the night and another was observed on the morning after admission; the diagnosis was considered sufficiently definite.

Lumbar puncture was performed and 3000 units of antitoxin were injected, a further 3000 units being given subcutaneously. The fluid withdrawn presented no abnormality but was under considerable pressure, 30 c.cm. being obtained in a very short time. After washing out the rectum grs. 20 of chloral hydrate were given in saline, and were retained. Similar doses of chloral were given each night, and occasionally by day as well, and on five occasions it was necessary to give morphia in doses up to gr. 1/8. For the first two days the only nourishment was glucose by the rectal route, but on the third day the spasm in the masseters relaxed enough to attempt oral feeding, which became easier as time went on, and fluid feeds up to 8 oz. soon became possible. At first attempts to feed by the mouth induced spasm of the pharynx. All sources of external irritation were removed by darkening the room, putting down a thick carpet, preventing noisy closure of the door, and so on.

Serum was given daily for five days intrathecally, subcutaneously, or both, and convulsions were notably fewer after its administration, and on some days were completely absent. The slight general rigidity, however, persisted. After the first day all tendon reflexes were abolished. The temperature varied between 101·8° and normal, and the pulse-rate between 144 and 88. There was never any anxiety on the score of heart failure though frequently the convulsions were alarming. On the ninth day after admission, as spasm was still present, it was decided to explore the nose again on the assumption that the site of inoculation was in the right nostril. A general anæsthetic was given, and after the removal of several more crusts Mr. Prance found a small linen-covered shirt button fairly firmly impacted beneath the inferior turbinate.

Spasm was relaxed in a few hours, there were no more convulsions, and from now onwards there was no further anxiety for the future. No more serum was given and in five days—the 14th after admission and the 18th from the first symptom—the child returned home. Convalescence was rapid, and when seen a month later the boy seemed quite well except for a slight shuffling in his gait. The tendon reflexes had returned.

It is to be regretted that a more thorough examination of the nose was not made sooner; had it been made the duration of the illness would have been shortened. Failure to isolate *Bacillus tetani* from cultures was disappointing, but I am confident of the correctness of the diagnosis, quite apart from the control of the symptoms obtained by administration of the appropriate serum; 21,000 units were given and no rash followed.

The points which make the case worth recording are: (1) Age of the patient. According to most authorities the chances of recovery at the age of 3 are few. (2) Site and vehicle of inoculation. Although children will insert all sorts of foreign bodies into the nostrils I can find no other record of tetanus arising in this manner. (3) The incomplete picture of cephalic tetanus. Stiffness of the neck and jaws were present but there was no paralysis of the muscles supplied by the facial nerve. This, when present, is supposed to be due to compression of the swollen nerve in its bony canal. The site of inoculation was in the area of supply of the second division of the fifth nerve, and the only effect on the facial nerve was one of stimulation, shown by twitching of the nose and angle of the mouth before spasm became general, and narrowing of the palpebral fissure by stimulation of the orbicularis palpebræ. (4) Complete cessation of symptoms after removal of the cause. (5) Absence of nasal discharge which would have pointed more clearly to it.

A CASE OF PULMONARY SARCOMA.

By O. W. Roberts, M.D., M.S. Lond., F.R.C.S. Eng.,
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A MARRIED woman, aged 35 years, was admitted to St. Giles's Hospital on Dec. 27th, 1929. She had enjoyed normal health until a fortnight before admission, when she had felt "run down" and had begun to have headaches. On admission she complained of severe headaches, general weakness, and impairment of memory; apart from these she had no symptoms. Clinical examination suggested a right-sided cerebral tumour associated with rapidly increasing intracranial pressure. A decompression operation was suggested, but the onset of signs of pulmonary œdema and the presence of dullness on percussion with absent breath sounds over the posterior part of the right lower lobe contra-indicated surgical interference. Intracranial symptoms increased and the patient died on Jan. 12th, 1930, one month after the onset of the first symptom.

Post-mortem examination.—The whole brain was œdematous and the convolutions were flattened. On section the cerebral and cerebellar hemispheres were found to be studded with numerous nodules varying in size from a pea to a plum. The nodules were situated in the white matter of the brain, being separated from the cortex by a narrow zone of white matter. Macroscopically they appeared to consist of soft vascular tissue which could be shelled out quite easily from the white matter, leaving a smooth depression. The larger nodules contained pus-like fluid from which a pneumococcus was cultured.

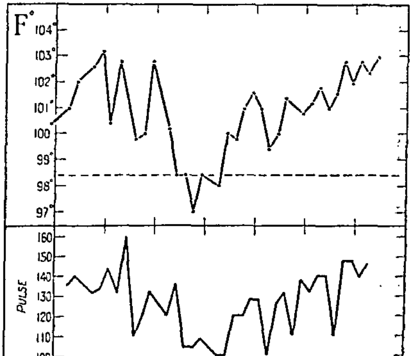
The lower lobe of the right lung was adherent to the diaphragm and to the chest wall posteriorly; on section a hard mass of new growth having irregular edges was found in the posterior part of the right lower lobe. Dilated bronchi containing purulent material were found in the tumour, and the macroscopic appearance suggested bronchial carcinoma. The other organs were apparently normal, and although a careful search was made no other deposits of new growth were found. Microscopic examination of specimens from the brain and lung showed a round-celled sarcoma.

The interesting points in this case are: the extremely short clinical history, the absence of any lung symptoms, and the distribution of the metastases. Intracranial abscesses complicating intrathoracic suppuration usually show a similar distribution to the metastases found in this tumour.

CEREBRAL HÆMORRHAGE FOLLOWING MENINGITIS IN A CHILD.

By L. I. M. Castleden, M.D. Lond.,
ASSISTANT MEDICAL OFFICER, HIGHGATE HOSPITAL.

"BEFORE the fifth decade cerebral hæmorrhage is rare," observes Osler, who further states that Holt had seen only one case under 10 years of age. In an investigation recently undertaken at the Hospital for Sick Children into cerebral hæmorrhage in children under 12, Sheldon [1] was able to find only 50 cases in his analysis of 10,150 consecutive autopsies. The comparative rarity of the condition therefore seems to justify the publication of the following notes of cerebral hæmorrhage in a child 1 year of age, additional interest being lent to the case by the fact that meningococcal meningitis was the possible precursor.



Temperature and pulse chart from admission to hospital on April 20th.

ACCOUNT OF THE CASE.

A boy, aged 1 year, was admitted to Highgate Hospital on April 20th, 1930, with a history of persistent vomiting and obstinate constipation for three weeks. During the preceding few days the child had frequently put his right hand to the right side of his head. On the day before admission there had been twitching of the left side of the face and of the left arm. There had been no vomiting or convulsions.

The birth had been Cæsarean. There had been no previous illness and the child had been quite well up the onset of vomiting. There was no family history of tuberculosis or venereal disease.

On *examination* the child was conscious, well-developed, and pale, but not dehydrated. The head was retracted and turned to the right. The frontal veins were somewhat prominent. Occasionally he put his right hand to his right ear, and he resented being touched or moved. There was no external evidence of trauma. The mouth, throat, ears, and mastoid regions were normal. A few small, firm, discrete glands were palpable in the posterior auricular and suboccipital regions of both sides. No abnormal physical signs were detected in the examination of the heart, lungs, or abdomen.

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[1] Sheldon, W. P. H.: Quart. Jour. Med., 1926–27, xx., 353.

The head was retracted, with rigidity of neck and back muscles. The pupils were equal and reacted to light. There was slight internal strabismus of the left eye, the ocular movements and vision being apparently good. There was left hemiplegia, maximal in the arm, which was adducted and flexed at elbow and wrist, with the forearm pronated. There was also rhythmical twitching, with a frequency of about 60 per minute, in the muscles of the left shoulder and arm and, to a lesser degree, in those of the left side of the face and thorax, and occasional arrhythmical twitches in the muscles of the left side of the abdomen and right side of the face. The reflexes were normal on the right side; on the left side those of the arm were uncertain but the knee- and ankle-jerks were definitely increased and the plantar response was extensor. Kernig's sign was negative. Abdominal reflexes were absent on the left side. The cerebro-spinal fluid was under increased pressure clear and faintly tinted yellow.

A provisional diagnosis of tuberculous meningitis, complicated by thrombosis in the right cerebral hemisphere, was made.

Course of Illness.—On April 21st, except that the twitching had lost its rhythmical character and occurred at infrequent intervals only, there was no change. Lumbar puncture yielded a fluid with the same characteristics as before. From this date until April 25th no alteration in the patient's condition occurred. Twitching then ceased entirely and he seemed slightly better. Lumbar puncture was not again performed. On April 26th he went into coma. The frontal veins were more prominent and there was no twitching. Both legs were now rigid, with increased tendon reflexes and bilateral positive Babinski's sign. The right abdominal reflexes were present and brisk, the left showed a very faint response. Physical examination was otherwise as before. On April 27th, after two generalised clonic convulsions, there was generalised rigidity, with conjugate deviation of the head and eyes to the right. Death occurred shortly afterwards.

Post-mortem examination.—Two soft enlarged glands were found at the bifurcation of the trachea. The thoracic viscera were otherwise normal, as were also the abdominal viscera.

The brain was very soft, with flattened convolutions and engorgement of the meningeal vessels. There were a few small extravasations of blood on the surface of the hemispheres. Along the course of the middle cerebral vessels there was a gelatinous semi-opaque exudate, in parts frankly purulent. Purulent exudate was also present on the under-surface of the cerebellum, involving the medulla and the roof of the fourth ventricle. The base of the brain was free from exudate. Several of the superficial veins of the cortex were thrombosed, being distended, firm, and of a reddish-maroon colour. This was most marked in the middle cerebral veins, and of these the right middle cerebral was the most affected. The ventricles were distended with blood-stained fluid. In the substance of the right cerebral hemisphere, in the region of the lenticular nucleus, there was a recent hæmorrhage which extended outwards to the cortex and inwards towards the internal capsule, but which had not ruptured either on to the surface of the brain or into the lateral ventricle. The basal ganglia of the left side, and the undamaged parts of those on the right side, were studded with minute petechial hæmorrhages, which were also found, though less abundantly, throughout the substance of the hemispheres.

No definite thrombosis of the cerebral sinuses was found. Both middle ears were normal. No aneurysm or other abnormality of the cerebral arteries was discovered.

Dr. J. G. Forbes made the following report on the cerebro-spinal fluid:—

Cerebro-spinal fluid.—A clear, slightly yellow fluid yielding a fine clot and a visible deposit of blood-cells. Films from the cell deposit show, in addition to red blood-cells, no marked leucocytosis. The lymphocytes are in excess of the polymorphonuclear cells, but there is no evident absolute lymphocytosis. The teased clot does not show abundant cells; no organisms were seen, and no tubercle bacilli were found after a long search. Albumin, a heavy trace = 0·14 per cent.; globulin, + +; dextrose, faint trace; colloidal benzoin reaction, negative; cultures sterile.

These indications are not obviously in favour of tuberculous meningitis, although it cannot be excluded. The case is possibly a post-basic meningitis which has passed the acute stage, but no evidence of meningococcal infection can be found. The cell content, however, does not clearly point to an inflammatory process. The unilateral character of the physical signs might be due to a lesion localised in the right hemisphere—e.g., meningeal hæmorrhage or thrombosis; this diagnosis would accord with the changes present in the fluid—viz., excess of protein, blood-cells, and serum.

On material sent for examination Dr. Forbes made the following report:—

Microscopical examination.—The cerebellum showed marked congestion of the meningeal vessels. The inflammatory cell exudate of the meninges was composed chiefly of polymorphonuclear cells. Among the inflammatory cells were seen diplococcal forms in units, suggestive of the meningococcus, but not identified in groups or masses, nor appearing intracellularly.

The substance of the optic thalamus was scattered with small hæmorrhages.

Sections of material from both right and left Sylvian fissures showed thrombosed vessels with extensive hæmorrhage undergoing organisation and studded with blood crystals. The exudate on the meningeal surface consisted chiefly of polymorphonuclear cells, apparently with diplococcal forms, as seen over the cerebellar meninges. No trace of tuberculosis was seen in any section.

The diagnosis is possibly meningococcal meningitis (post-basic), resulting in blood infection and invasion of the cerebral vessel walls, this giving rise to thrombosis and consequent hæmorrhage into the substance of the cerebrum.

DISCUSSION.

If intracranial hæmorrhage following birth injuries and postnatal traumata be excluded, then thrombosis of the vessels of the brain, or of the sinuses and their tributaries, is the most common precursor of cerebral hæmorrhage in children. This thrombosis is either marantic or infective in origin, the marantic variety occurring most commonly in the superior longitudinal sinus whilst the infective may occur in any situation as a sequel of septic or tuberculous processes, but is most usually seen in the lateral sinus following suppuration in the mastoid. For these reasons it is easy to see why the commonest situation of intracranial hæmorrhage in children is meningeal. Of Sheldon's[1] 50 cases, 28 were extra-cerebral and 22 intra-cerebral, though arterial hæmorrhage and hæmorrhage following trauma were included in his series. Cobb and Hubbard[2] published, amongst other cases, one of cerebral hæmorrhage in a girl of 2¼ years of age following thrombosis of pial veins. In this case otitis preceded the meningitis.

As the notes of the case here recorded show, it was an unusual one in that meningococcal meningitis was the possible precursor, and also in the fact that the site of the large hæmorrhage was intracerebral. From the distribution of the paralysis the primary vascular lesion must have been one which affected, in addition to the lenticular nucleus, the region of the genu of the right internal capsule, giving the greatest functional disturbance in the left arm, less in the left side of the face and trunk, and least in the left leg. Its location was of further interest in view of the rhythmical nature of the twitching observed early in the course of the fatal complication, interference with the large-celled pallidal or motor system of the lenticular nucleus "releasing" sub-pallidal motor centres and producing muscular hypertonicity and rhythmic tremor of the rigid limbs.[3] The absence of convulsions, except as an almost terminal event, is also in favour of the thrombosis being initially intracerebral rather than cortical.

Thrombosis in the right internal cerebral vein could have produced the syndrome observed, by stasis of the circulation and anoxæmia in the right basal ganglia and internal capsule, the damage to the vessels so caused being the determining factor in the hæmorrhage found in this situation post mortem. Thrombosis in this vein, spreading backwards, later reaching the great vein of Galen and so obstructing the left internal cerebral vein as well, would account for the ventricles being distended with fluid, a condition found when the veins of Galen are occluded; these veins are formed by the junction of the venæ corporis striati with the choroid veins. The distension of the veins on the forehead is hard to explain in the absence of thrombosis in the superior longitudinal sinus. In marantic thrombosis of this sinus it is common to find, together with convulsions, distension of the veins of the scalp and of the nasal veins, and epistaxis. Possibly the raised intracranial pressure interfered with the cerebral venous circulation sufficiently to produce this sign.

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[2] Cobb, F., and Hubbard, J. P.: Amer. Jour. Med. Sci., 1929, clxxviii., 693.

[3] Purves-Stewart, J.: The Diagnosis of Nervous Diseases, 1924, London, p. 16.

Since the work of Charcot and Bouchard, the question of arterial cerebral hæmorrhage has been thoroughly investigated. Hæmorrhage from the capillaries and veins of the brain, however, seems to have received but little attention. The latter is either rare or is considered of small importance, the lesions being usually described as hæmorrhagic encephalitis. The encephalitis, if present, probably acts on the veins merely by thrombosis, hæmorrhage resulting from mechanical obstruction to the venous circulation, with increased venous pressure and local damage to the vessel wall from anoxæmia.

This case, then, suggests a rare complication of meningococcal meningitis and demonstrates the possibility of intracerebral hæmorrhage of venous origin at a site usually associated with arterial vascular lesions.

I wish to thank Dr. C. Thackray for permission to publish this case, and also Dr. J. G. Forbes for his kind consent to my including his pathological and histological reports from the London County Council Bacteriological Laboratory, County Hall.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE.

CLINICAL SECTION.

EXHIBITION OF CASES AND SPECIMENS.

At a meeting of this section held on April 17th the chair was taken by Mr. C. P. G. **Wakeley**, the President, who showed a case of old crush fracture of the lumbar vertebræ. The man, aged 47, had first been seen on March 3rd last, complaining of weakness and pain in the lumbo-sacral region for ten years. He was unable to pick up heavy objects from the ground. His only injury had been a fall at the age of 4. There was an old crush fracture of the third and fourth lumbar vertebræ, but no evidence of bone disease. Diathermy had been tried, but had made the pain worse. A week later, after resuming work, the pain had almost disappeared. The case showed that crush fractures did develop in children. The pain was probably due to osteo-arthritis. Mr. Wakeley also showed a large congenital lymphangioma in the face of a five-weeks-old baby which was doing well, and asked what, if anything, should be done. In his third case the patient was a woman aged 53, who had been operated on in 1902 for carcinoma of the right side of the tongue. The glands had not been infected, but the growth had been a squamous-celled carcinoma. The operation had not proved a mutilating one, and she was now in good health.

Mr. **Eric Crook** suggested that radium might be useful for the baby. Mr. Wakeley said he was inclined to wait, since these conditions sometimes cleared up. Sodium morrhuate had also been suggested.

Mr. C. W. G. **Bryan** showed a case of painless swelling on the sternum in a girl aged 8½. X rays showed much new bone formation at the edges of a rarefied area beneath the tumour. No fluid had been obtained by aspiration, and other investigations had given negative results. The tumour had considerably increased in size after two weeks' treatment by potassium iodide.—The **President** thought the tumour was tuberculous.

DISEASES OF THE COLON AND RECTUM.

Mr. J. P. **Lockhart-Mummery** showed five cases: a megacolon treated successfully by appendicostomy; a complete colectomy for adenomatosis; another case of adenomatosis with cancer; and two cases of rectal cancer cured by operation. The first patient had done very well as long as she had used the appendicostomy to wash out the bowel, but had relapsed when she allowed it to close. Reopening had again made her comfortable. In the second case the whole bowel had been involved up to the cæcum; the polyps in the rectum tended to recur, but could be controlled. The patient showed a remarkable family history, her mother and six aunts and uncles having died at an early age of carcinoma of the bowel. Her only other living relative also had adenomatosis. A similar family history had been traced in 13 cases, and they had all died of cancer. The rectal cases were two out of 58 operated on more than seven years ago and now alive and well.

Mr. **Crook** agreed that adenomatosis often ended in carcinoma, usually, he thought, at the lower end. Colectomy left behind the part where polypi formed, and possibly the site of cancer.

Mr. G. E. **Parker** asked to what extent the small bowel compensated in these cases, and whether the patients suffered from diarrhœa.

Mr. F. F. **Hellier** asked what was the relation between polypi and carcinoma.

Mr. **Lockhart-Mummery** replied that the lower end of the ileum dilated considerably. It would be ideal to remove the rectum too, but the ileum could not be implanted into the skin. He thought that all carcinomata of the bowel arose originally from simple tumours. Hyperplasia of the bowel showed itself, probably, as adenoma in early middle age. The growths in the rectum were more likely than others to become malignant.

LARYNGITIS IN SCARLET FEVER.

Dr. J. D. **Rolleston**, on behalf of himself and Dr. D. G. **Macpherson**, showed a case of tracheotomy for œdematous laryngitis in a woman with scarlet fever. The case had previously been mild, but after the sixth day the temperature had risen and adenitis had appeared. On the tenth day of the disease she had developed urgent dyspnœa, and tracheotomy had been performed in extremis. The wound had become very septic, and the temperature had continued high. The case had been further complicated by cellulitis of the neck and pleural effusion. The patient had twice received 40 c.cm. of antitoxin, but without benefit. The temperature had not returned to normal until the forty-sixth day of the disease, but she had finally recovered. The case was unique in Dr. Rolleston's experience; any serious involvement of the larynx in scarlet fever was very rare, and tracheotomy was now hardly ever performed in fever hospitals. Pleurisy was also rare in scarlet fever, and usually went on to empyema.

Dr. W. C. **Gunn** said that recovery was extremely rare in cases of this kind, and described a patient he had seen; death had been due to septic pneumonia associated with pressure on trachea and bronchi. He had seen quite a number of cases of laryngitis in the course of scarlet fever, but they had been due to associated infections and not to the scarlatinal streptococcus.—Sir **James Dundas-Grant** said that the free incision through the œdematous tissues of the neck had played its part in saving the life of this patient.—Mr. **Crook** thought it extraordinary that œdema of the larynx was not more common; œdema would be expected to track back from the inflamed glands.

Dr. **Rolleston** suggested that the reason was the reduced virulence of streptococci nowadays.

UNEQUAL PULSE: ANEURYSM.

Dr. D. E. **Bedford** showed a female patient, aged 49, in whom inequality of the pulse and pupils was associated with hypertension and aortic incompetence. The left radial and brachial pulses were scarcely palpable, and the blood pressure on that side was 100/75. The right radial and brachial arteries were thickened, and the blood pressure was 200/40. There was a similar difference in pressure at the knees. There were no signs of a collateral circulation. She seemed to have an occlusion of the left subclavian artery of at least ten years' standing. It was probably not syphilitic, since she had survived so long and the Wassermann reaction was negative. The only possibility seemed to be stenosis of the isthmus of the aorta, involving the left subclavian and left carotid orifices. There was no sign of aortic aneurysm on radiographic examination.

Sir **James Dundas-Grant** asked why the suggested condition should affect the left lower extremity.—Dr. F. **Stolkind** mentioned a patient with syphilitic aortitis who had survived over 20 years, and described a case of unequal pulse due to syphilis.—Mr. **Harold Edwards** showed a case of popliteal aneurysm six months after the Hunterian operation. The aneurysm had been very large and adherent. The result had been very successful.—Sir **James Dundas-Grant** remarked on the safety of the operation.

Mr. **Crook** showed a boy of 18 months who had been born with exomphalos, the cord containing a large portion of liver, but no intestine. The child had been left with wide divarication of the recti.

The **President** said he thought that the recti would come together in time.

Dr. W. L. **Hartston** showed a case of

GAUCHER'S DISEASE.

The boy was six years old, and had had a large abdomen from the age of 18 months. Two brothers were alleged to have had enlarged liver and spleen, one being stillborn and the other having died at the age of two. This boy was wholly pigmented a dirty brown, had clubbing of all the fingers, genu valgum, and pes plano-valgus. There was no ascites and no adenopathy. There was osteoporosis of all the skeletal bones, with marked thinning of the corticalis, but the pituitary fossa was normal. The skin showed increased pigment deposit in the basal-cell layer, and the blood-cholesterol was greatly raised—between 220 and 360 mg. per cent. Splenic puncture revealed groups of large clear cells without fat, like Gaucher cells.

Dr. **Helen Mackay** spoke of her difficulty in obtaining tissue by splenic puncture. She did not think this case was pure Gaucher's disease, as the patient was more backward than could be accounted for in this way.—Dr. **Alice King** said she had known other cases in which a family history had figured.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF SURGERY.

At a meeting of this section on April 10th, with Mr. R. **Atkinson Stoney**, the President, in the chair, Mr. **Seton Pringle** reported two cases of

POPLITEAL ANEURYSM.

Both patients were elderly men with marked hardening of the arteries. In one, the Wassermann reaction was positive and in the other negative. In each case there was marked circulatory disturbance of the leg—œdema, enlargement of veins, and duskiness of the skin—with, in one case, gangrene of the tips of three toes. Both had very severe pain.

In the first case the femoral artery in Hunter's canal, enclosed in its sheath, was divided between two ligatures. In the second the lumen of the vessel was occluded by multiple ligatures and the sheath was injected with alcohol. In both, the femoral vein was divided between ligatures. The usual post-operative precautions were taken, and the condition of the circulation in the foot on the affected side did not give rise to any anxiety after the first few hours. Both aneurysms ceased pulsating; as soon as the ligatures were tied they rapidly hardened, and gradually decreased in size. Both patients, 15 and 4 months after operation respectively, are in good general health and able to get about.

The **President** said that such aneurysms were comparatively rare. It had been formerly taught that, if the main artery and main vein were tied up together, gangrene was almost certain.

Mr. W. **Pearson** said it was more difficult to get good results in pathological than in traumatic aneurysm. In a case of subclavian aneurysm, with a strongly positive Wassermann reaction, he had obtained an excellent result by distal ligation.

RUPTURED SPLEEN.

Mr. **Seton Pringle** also described a case of spontaneous rupture of the spleen, occurring in a healthy man who was riding round his farm. There was no history of even slight trauma. The patient was suddenly seized with very acute abdominal pain, slipped off his pony, and was found in a collapsed condition. On admission to hospital five days later it was thought that he had a minute duodenal perforation, with gradually extending extravasation. At operation the abdomen was full of blood, originating in a rupture of the spleen. The spleen was removed without difficulty, but the patient developed pneumonia and died.

Growth of Contributory Schemes.—Last year the weekly contribution scheme of the Royal Berkshire and Associated Hospitals Aid Committee produced £31,136, an increase of £1223, notwithstanding that membership is now limited to those who are not liable to income-tax. At the same time the administrative expenses have been reduced.—The Salisbury and District Infirmary League collected £12,750, an increase of £700.

REVIEWS AND NOTICES OF BOOKS

Irradiation with the Alpine Sun Quartz Lamp,

including some account of Luminous Heat Rays. By HUGO BACH, Geh. Sanitätsrat, Dresden, with the assistance of Dr. FERDINAND ROHR. English edition. Edited by R. KING BROWN, B.A., M.D., D.P.H. Slough: Sollux Publishing Co. 1931. Pp. 218. 10s. 6d.

THE first water-cooled quartz lamp was introduced by the Hanau Quartz Lamp Co. in 1906, and a few years later, in 1910, Dr. Bach designed the air-cooled mercury-vapour lamp which achieved immediate popularity and became one of the standard models used in the practice of actinotherapy. In this small manual Dr. Bach gives his reasons for preferring quartz light treatment to other forms of ultra-violet irradiation. In order to raise the ultra-violet output of carbon-arc lamps very strong currents must be used. Lamps using 30 to 70 ampères are necessary to obtain satisfactory clinical results. This increases the cost of treatment and requires special electrical installations. Dr. Bach grants that these powerful carbon-arc lamps give very good clinical results and that in the domain of surgical tuberculosis they may outclass a single quartz lamp in their effect, the quartz lamp emission containing only a small proportion of luminous heat rays. He himself prefers, however, to use the quartz lamp for the treatment of all clinical conditions and to supplement the emission of his mercury-vapour lamp with that of a Tungsten filament lamp. The excellent results which have been obtained in the Finsen Institute with powerful carbon-arc lamps in the treatment of surgical tuberculosis will make most actinotherapists hesitate to change the method of treatment at present in common use, but a parallel series of cases treated (*a*) with carbon-arc lamps and (*b*) with mercury-vapour lamps supplemented by powerful Tungsten filament lamps, would be of great clinical significance. Dr. Bach's contention that it is important to be able to graduate the percentage amount of the rays of various wave-lengths in the total radiation will apppeal to everyone anxious to advance the science of actinotherapy, and it is a step towards the use of monochromatic light in clinical practice.

The views of the author on the treatment of phthisical patients are of special interest inasmuch as he may justly claim to be one of the earliest pioneers in this branch. He believes that, in general, phthisical patients are only suitable subjects for irradiation if their condition is stationary or tending to latency; the exudative and open forms of pulmonary tuberculosis need sanatorium treatment. In this latter group of patients, whether at an initial or advanced stage of tuberculosis, irradiation is a useful adjuvant; appetite and sleep are promoted, and the general condition may show marked improvement. Where there is failure to produce protective and curative substances in response to treatment, radiation will be just as useless in preventing death as is any other measure. Dr. Bach gives the impression that it is difficult to harm a phthisical patient by ultra-violet irradiation, if this is conducted cautiously and erythema-production is avoided. This is not a view generally accepted in this country nor is it held by all continental authorities.

This manual will prove of interest to all experienced workers in actinotherapy; it is less suitable for the student or the beginner since it represents a one-sided statement of the subject and is, moreover, not quite up to date, the references being mainly to work published before 1925. Dr. King Brown's translation is excellent.

Handbook of Anatomy.

By JAMES K. YOUNG, M.D., F.A.C.S., late Professor of Orthopædics, Graduate School of Medicine, Pennsylvania University. Seventh edition, revised by GEORGE W. MULLER, M.D., F.A.C.S., Associate in Anatomy, Jefferson Medical College. Philadelphia: F. A. Davis Company. 1930. Pp. 400.

JUDGING from the number of editions published since it was first written, this book appears to be in some demand in the country of its origin. It seems to us to be a well-produced work, composed solely from the point of view of examination needs. It cannot be taken as an indication of the standard of anatomy in the United States, nor yet as a book of reference on the subject. With these reservations we may say that it seems to be a reliable and useful member of its class, although we deplore the substitution of Latin names for perfectly good and descriptive English terms; yet they are better than such horrible expressions as *linguad* and *dorsad to.* A short but useful section on dental anatomy closes the book.

Anatomie und Pathologie der Spontanerkrankungen der kleinen Laboratoriumstiere.

Edited by RUDOLF JAFFÉ. Berlin: Julius Springer. 1931. Pp. 832. With 270 illustrations. R.M.98 (unbound).

THIS book should be of great value to laboratory workers. It contains articles by 29 different authors, many of whom are well-known pathologists, and is under the general editorship of Prof. Rudolf Jaffé, who has himself made considerable contributions to the text. It deals exclusively with diseases which occur naturally among the four species—guinea-pigs, rabbits, rats, and mice. The results of experimental infection with these diseases are also dealt with, though not exhaustively. The first or "special" part consists of 563 pages on the normal and pathological anatomy and the histology of the various organs, including the blood. In the 70 pages devoted to the urinogenital system are included the anatomy and physiology of the genital cycle in rodents, the phenomena of ovulation, pregnancy, placentation, and the senile changes in the genital organs. A treatise on the endocrine glands occupies 40 pages, and 25 are given to the skin. The chapter on the sense organs occupies 82 pages, which seems disproportionately long; but the information would be difficult to find elsewhere. That on the nervous system, by Dr. B. Ostertag (50 pages), is a very useful contribution. The "general" part deals with infection due to bacteria, protozoa, viruses, and metazoal parasites. These infective agents are described in some detail, but not always completely, and reference is made to fuller accounts in more specialised treatises. This part also includes a chapter by Dr. Fr. Heim and Prof. Ph. Schwartz on spontaneous tumours in rodents. The section on bacteriology is written by Prof. O. Seifried, and that on trypanosomes and spirochætes by Prof. H. Schlossberger and Dr. W. Worms. Prof. J. Fiebiger deals with the other protozoal, worm, and arthropod parasites of each of the four mammalian hosts separately. There is also a chapter on normal and abnormal carbohydrate metabolism. The arrangement of the book has been difficult, and appears in some places to be rather illogical, but an excellent index makes it easy to find any given subject. The illustrations, macroscopic and microscopic, are well reproduced, and some are original. On the whole the descriptions of anatomy and pathology are clear and informing. Considerable familiarity with English, American, and French work is shown, and full references are given.

A work of this kind has been much needed, but, as Prof. Jaffé realises, the inclusion of the diseases of monkeys and birds, if not of dogs and cats, would have greatly added to its value. In the limited field which it covers it is without a rival, and its publication will be welcomed.

Elementary Biology for Matriculation and Allied Examinations.

By MARY E. PHILLIPS, B.Sc., and LUCY E. COX, B.Sc. London: University of London Press. 1931. With 282 text-figures. Pp. 465. 7*s.* 6*d.*

IF matriculation students have to know all that this book tells them about animals and plants they will certainly be armed with a comprehensive knowledge of biology. It is because the book is likely to appeal to more advanced readers that it deserves special notice. It is very well compiled; there is the due mixture of structure, function, and nature study, the text is clear and interesting, and the illustrations first-rate. Covering the range they do, the writers cannot be expected to have a specialist's knowledge of every detail; superficial burns are dangerous through chemical, not nervous, shock (p. 224), the tapetum of the cat's eye is hardly "metallic" (p. 235), the relation of iodine to goitre, as stated on p. 197, is unintelligible. But much more than this could be forgiven for the saying (p. 441) "to understand bacteria they must be looked at from their own point of view; they are not themselves concerned in being either public benefactors or public scourges; they are simply minute living organisms." If students are taught in that spirit, they are on the right road.

Physiological Chemistry.

Fifth edition. By A. P. MATHEWS, Ph.D., Carnegie Professor of Biochemistry, University of Cincinnati. London: Ballière, Tindall and Cox. 1930. Pp. 1233. 15*s.*

THIS book, of which the fifth edition is now before us, has the distinction of being the first text-book on biochemistry in the English language. The first edition was published in 1915, and must be regarded as the parent of the many hundreds of text-books now on the market. Whilst some of these later authors acknowledge the debt, some do not. When first issued the book was of small bulk, but the fifth edition is a large and heavy volume of over 1200 pages. We have praised the work before, and need repeat only that its great value lies in the fact that an unbiased opinion on any biochemical problem may be found in it. One or two criticisms must be made. The sections on internal secretion, particularly those on the sex glands, are out of date. The author shows little knowledge of work done outside America; thus œstrin is dismissed in a very few words, and the male hormone is barely mentioned. Again, the question of tissue respiration is not adequately dealt with in a book of this size. But in spite of a few omissions the book can be commended to students for a full and well-written account of modern biochemistry.

Die Fadenpilzerkrankungen des Menschen.

Second edition. By R. O. STEIN, Professor of Dermatology, Vienna. Munich: J. F. Lehmann's Med. Atlases. 1930. Vol. XII. Pp. 128. With 107 illustrations. R.M.12.

THE text of this well-known atlas of the human mycoses, which first appeared in 1914, has been amplified by 33 pages, but there has been no increase in the number of plates or illustrations, which remain as they were in the first edition. The text has been improved by a table of contents, previously omitted. This includes a brief description of the morphology of the fungi concerned, staining and microscopic technique, culture methods, animal inoculation experiments, immunity reactions, including skin tests, and the preparation of trichophytin. This section occupies only 16 pages, and is followed by a detailed and illustrated description of all the cutaneous fungus diseases common to man, their pathology, diagnosis, and treatment. Of particular interest is the section dealing with the mycotic eruptions (eczematous) of the palms and soles, and their clinical differentiation into disidrotic, squamous, and intertriginous forms. The immense number of alleged pathogenic fungi makes a standard nomenclature difficult, and it will be long before this special branch of dermatology can approach completion. The increasing frequency and recognition of these cases has resulted in the publication of many papers both in Europe and America during the last decade, and the classification here adopted cannot be regarded as in any degree final.

An Introduction to Medical History- and Case-taking.

By GEOFFREY BOURNE, M.D. Lond., F.R.C.P., Assistant Physician, St. Bartholomew's Hospital. Edinburgh: E. and S. Livingstone. 1931. Pp. 195. 5*s.*

Dr. Geoffrey Bourne has written this little volume to help the medical student beginning his clinical work in the wards. It is divided into five sections, made up of history-taking, physical examination, diagnosis, prognosis, and treatment. Those who remember their first bewilderment when confronted with patients in the wards will also remember the poor comfort that the standard medical text-books seemed to provide, and the need for some small practical manual to help them in the difficult task of taking histories. Fortunately or unfortunately, it is true that nothing can take the place of actual teaching in the wards as an introduction to clinical medicine, but Dr. Bourne has provided an admirable elementary guide to supplement bedside instruction. Bad history-taking is a fault that is not always due to slackness on the part of the student, though this is an assumption that chiefs find convenient when they do not wish to impute lack of a thorough grounding by medical tutors. This volume provides the framework on which the student can build. The teaching is somewhat dogmatic, but the student will find it simple, concise, and easy to read, and much of the practical advice would not be wasted upon his seniors.

THE LANCET.

LONDON: SATURDAY, APRIL 25, 1931.

THE CENSUS.

THE census of the population of England and Wales, to be taken on Sunday night, marks the 130th anniversary of the adoption in this country of this important instrument of government—a respectable age in these days of widely advertised defences against senility. Yet each successive decennial enumeration, and this is the fourteenth, bears none of the disturbing signs of approaching dissolution arising from old age, but exhibits, on the contrary, clear signs of growth and development, and of a design to attain to greater perfection and accuracy in the collection and presentation of the data. In the past, misguided people burdened with a sufficiency of ignorance have regarded the practice with disfavour, but if we are to judge from the numerous references to the forthcoming census in the daily press, to broadcast talks on various aspects of census-taking, and to other manifestations of like kind which have been brought under the public notice during the past few weeks, it would appear that the importance of the undertaking is at length to receive adequate appreciation.

Although the primary object of this periodical inventory is the accurate determination of the numbers, constitution, and local distribution of the country's most valuable asset, the results of the count may be, and have frequently been, applied to purposes far beyond the limited field envisaged by these fundamental requirements. On the eve of the last decennial census, in these columns, we briefly discussed the value of census data to workers in the fields of demography and preventive medicine, mentioning inter alia that the incidence of natality, fertility, disease, and mortality were phenomena largely dependent upon the age and sex distribution of a people, and indicating how the census furnishes the information indispensable to the proper interpretation of these and other manifestations. But while census reports are tools necessary to the scientific researches of the vital statistician and the epidemiologist, they have become no less indispensable in other fields of inquiry. Reference to the published results of successive censuses reveals a steady expansion in the amount and variety of census data, suggestive of an increasing demand for such information resulting from a realisation that these data are fundamental to every kind of investigation associated with the commercial, economic, social, and other activities of the nation. It is indeed impossible to over-estimate the value of these clear summary statements concerned with the eddying tides of humanity. They provide the keys to a better understanding of the complex causes underlying some of the occupational changes which may have been observed between one decade and another; enable the tabulation of information relating to unemployment, thereby revealing the character and extent of such social and economic disturbances; are a measure of the increase or decrease in the numbers of people of foreign birth resident in this country, and of their share in the national life; throw light upon the size and structure of families, the circumstances under which human beings herd together, and the changing conditions of residence in urban and rural areas; enumerate with accuracy the numbers of widows, old-age pensioners and other dependent persons, and enable the assessment of the relative proportions of the agricultural, manufacturing, or other activities of the people. These, and other equally important items of information made available by the application of the census method of enumeration, have proved a source of inspiration to countless investigators, have served to arouse thoughtful citizens to realisation of conditions or developments demanding remedial action, and have contributed both directly and indirectly to bring about silent revolutions which have culminated in furthering the physical and social welfare of the nation.

If the statesman, hygienist, economist, sociologist, or other worker desires to build effectively and without misdirected effort, he is compelled to-day to enlist the services of the results of the periodical counting wherein are presented faithful pictures of existing conditions. The regularity of the count permits the comparability of data at different periods of time, currents of movement may be traced, changes in welfare indicating progress or retrogression of the human stock comprising the wealth of the nation are readily observable, and in the light of such knowledge future action may be determined with surer promise of success. From the medical point of view the planning of the enumeration to be made on Sunday night introduces one feature of considerable importance—viz., the schedule provides for a record of the place of habitual residence of persons enumerated elsewhere than in their own homes. This is a commendable change which will permit the more exact determination of local populations and more reliable calculation of local mortality-rates. Deaths are registered in the registration sub-district in which they occur, but are tabulated according to the district of habitual residence of the deceased. Up to the present it has been customary after each census inquiry to allocate all enumerated persons to the area wherein they happened to be at the time of the count; the practice about to be introduced will provide for a very necessary correction of the denominator of the fraction involved in the calculation of mortality and other rates.

The Census Office of the Registrar-General may be likened to a vast national laboratory wherein workers are engaged in the assembly and classification of the multitudinous details relating to human units, and in preparing and publishing a variety of exact facts upon which sound judgments may be based. These orderly analyses are of profound importance in the present age of expert investigation wherein problems of every aspect of human activity demand fuller and more precise information than was formerly considered necessary. The increased use of these data so evident in recent years, and the growing desire for systematic knowledge manifested by thinking people, are not only tokens of progress and enlightenment, but are abundant testimony that the results of the decennial count provide an efficient barometer of human development.

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SYMPATHETIC RAMISECTION IN SPASTIC PARALYSIS.

THE value of sympathetic ramisection in spastic paralysis has been much disputed. A group of orthopædic surgeons and neurologists reported unfavourably on six cases operated on in this country by the originator of the operation, Mr. N. D. ROYLE,[1] but at the Winnipeg meeting of the British Medical Association ROYLE found a good deal of support from American and Canadian surgeons.[2]

A further study of 83 cases has now been published by W. B. CARRELL[3] who, with his colleagues, has performed 23 cervical and 60 lumbar ramisections in spastic paralysis. He has encountered great difficulty in estimating the effects of the operation, for other measures were often undertaken concurrently, but he thinks that in practice reasonable accuracy has been attained. The reflexes showed no modification, but the patients who showed most improvement had a relative increase in active joint range. No change was noted in fixed contractions or in contractions which develop on attempting motion or on excitation, but a paraplegic seemed to have better function in the leg with lumbar ramisection and obturator section than with the latter operation alone. No appreciable improvement was ever seen immediately after operation, but when the time came for the patients to go to the gymnasium they gave better response to tests there than they had done before operation. The gymnasium work could not be credited with all the benefit, for the same work on patients who had not undergone ramisection did not produce the same results. But in CARRELL's experience if it were necessary to choose between ramisection and Stoeffel operations with foot stabilisation, the two latter procedures would be more often indicated and give a higher percentage of improvement in a large group of cases. The age of the patient and the type of paralysis seemed to be of less significance in the result than the severity of the lesion and the mental development. In the lumbar group the average gain was 16 per cent.; in 14 cases there was no gain, and in these the average age was $9\frac{1}{2}$ and the mentality $63\frac{1}{4}$; while in 12 cases with more than 25 per cent. gain the age was $10\frac{3}{4}$ and the mentality $81\frac{1}{4}$. CARRELL points out that if ramisection produces results by release of impulses affecting striated muscle there should be some evidence of changed reactions, yet in 14 cases no changes were observed. There was a high percentage of improvement in patients on whom the operation was performed on both sides, but no corresponding improvement when a cervical operation was followed by a lumbar, or vice versa. In 12 cases ganglionectomy was substituted for ramisection, with slightly better results. The 23 cervical cases were disappointing; 11 cases were not improved, 6 showed 10–15 per cent., and 5 showed 25–40 per cent. improvement. CARRELL's conclusion is that there is something definitely useful in ramisection which may be added to but not substituted for other procedures in the treatment of spastic paralysis. The orthopædist is thankful even for 10–25 per cent. improvement in these distressing cases.

In an accompanying paper in the same journal W. K. LIVINGSTON attempts to rationalise the surgery of the sympathetic system by regarding smooth muscle hypertonus or spasm as the underlying common characteristic of a number of syndromes for which sympathectomy may be useful, the visceral pain group being due to abnormal changes in tonus of peripheral blood-vessels, the gastro-intestinal group to hypertonus of sphincters, and the vascular group to reflex diminution in blood-supply. He includes chronic arthritis in his third group, since the balance between wear and repair in a joint is dependent on adequate vascular response to function, and benefit has followed unilateral lumbar ganglionectomy in some of his cases. Many cases of obliterative endarteritis show an added element of spasm, he maintains, and sympathectomy will improve such cases. He suggests three ways of deciding whether or not a patient will benefit from operation. Oscillometry reveals an abnormal restriction in the amplitude of pulse oscillation, particularly after exposure to cold, while the fever test consists in the production of pyrexia and measurement of the vasomotor index or ratio between the rise in mouth temperature and the rise in temperature of the affected extremity. The best method, however, is to note the changes that follow selective injection of sympathetic ganglia with procaine hydrochloride; this is not difficult or dangerous, and it accurately produces for a time the results that may be expected to appear permanently after surgical excision of the ganglia. He considers that it should prove valuable in enlarging the field of sympathetic surgery.

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WILDER ANIMALS.

ON Saturday, May 23rd, will be opened to the public a new zoological park in which many of the animals at present in the gardens of the Zoological Society at Regent's Park can be seen living under more natural conditions. The park occupies an estate of 500 acres on the Chiltern hills between Tring and Luton, and is being made accessible from Watling-street by a new road leaving the street a little north of Markyate and crossing Whipsnade Heath. On this property four chalkpits have been excavated primarily to obtain materials for road-making, but with the ultimate object of serving as dens for the larger carnivora, and many coniferous trees have been planted to form backgrounds for panoramas; enclosures for bison, wolves, bears, wombats, marmots, and woodchucks have been completed; six panorama paddocks and an enclosure for kangaroos have been laid out. Since the property has been enclosed wild flowers have increased greatly and many orchids and other plants natural to the chalk region, but wholly or nearly exterminated, have been reintroduced, and native birds have nested there in increasing numbers. The park is thus to be a sanctuary for British wild birds and the flowers, trees, and shrubs natural to the region. The more important animals already at Whipsnade, many of them the gift of the Duke of BEDFORD, President of the Society, are camels, llamas, zebras, eland, bison, bears, wolves, muntjac, Chinese water deer, fallow deer, black buck, marmots, woodchucks, wombats, sarus cranes, rheas, pheasants, turkeys, geese, and swans. One consequence of the greater freedom given to the animals is the possibility of risk to visitors, who are warned that the Society disclaims responsibility for damage caused by too close an approach to the fences or barriers, or by any attempt to stroke or touch the animals. Children under 12 will only be admitted to the park on the condition that their guardians make themselves personally responsible for their safety.

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[1] THE LANCET, 1930, ii., 127.

[2] Ibid., p. 645.

[3] Jour. Amer. Med. Assoc., March 14th, p. 849.

The opening of the Whipsnade park is but a logical extension of the aim to let the animals feel at home. To what extent this has been already carried out under the enlightened directorship of Sir PETER CHALMERS MITCHELL and his staff is not perhaps as well known as it should be. There has been a steady reduction in morbidity among all classes of animals in the Zoo. It has been taken for granted that rickets and allied bone diseases can be prevented, in animals as in man, by hygienic living. During the past year only 26 animals died primarily from rickets and osteomalacia: most of these arrived at the Zoo in rickety condition; in only three animals, including a monkey and a douroucouli, did the disease originate in the gardens. For some years artificial light has been installed in the monkey-house to supplement the sunshine to which all anthropoids are racially entitled. A study of the heading "Commissariat" in the Society's annual report reveals the variety of foodstuffs which are provided for the animals, ranging from vast quantities of staples such as hay (168 tons), oats (748½ quarters), locust beans (79 cwts.), horseflesh (269 tons), down to shrimps (2178 pints), sultanas (104 lb.), ant eggs (461 lb.), dried flies (709 lb.), and golden syrup (148 lb). Tuberculosis now accounts for a bare 3·4 per cent. of the total deaths in the Zoo, and the only tuberculous lesions found in monkeys were in two individuals which died in quarantine a few days after arrival. Apparently no monkey or ape contracted tuberculosis in the gardens during the year. On the other hand, it is interesting to note that an old tiger died from tuberculosis of the lungs with extensive cavitation, and an Indian fruit-bat of eight years residence from intestinal tuberculosis. Respiratory diseases in general were fewer. Colonel A. E. HAMERTON remarks that the seasonal fluctuation in the mortality from diseases in this category corresponds with that of the human population living in northern cities. Seven birds died from bird malaria and five from heart disease. In other cases conditions were found analogous to those met with in human practice. Two mammals died from ureteral obstruction by renal stone. Hepatic disease caused 20 deaths, two of which were associated with gall-stones. New growths were found in five mammals and two birds; a grison died from cancer of the liver, and a mynah from cancer of the pancreas. Immunity from epidemic disease is maintained by the new isolation hospital on the north bank, the efficacy of which was tested on several occasions by outbreaks of cat distemper which were confined to a few isolated cases.

Under the more natural conditions at Regent's Park animals are continually breeding more freely, although the infantile mortality from various causes is still high. A baby sacred baboon was killed by a companion at six months old, a mother wolf destroyed five of her six cubs at four days old, and an American bison calf was accidentally killed by its father when 12 days old. Nevertheless the list of mammals successfully reared last year is very striking; it includes two pygmy hippopotamuses, a Californian sea-lion, a Canadian beaver, three lion cubs, wallabies, marmots, lemurs, and a host of hoofed creatures. What are the genetic opportunities of Whipsnade can hardly be forecast.

THE BRITISH SOCIAL HYGIENE COUNCIL.

A LECTURE was delivered on Tuesday, under the auspices of the British Social Hygiene Council, with the Duchess of Atholl in the chair, at the Marble Arch Rooms, London, on Social Hygiene and the Family, by Dr. Maurice A. Bigelow, professor of biology in Columbia University, who has been delegated to Europe to observe the development of social hygiene during the past ten years. Speaking from personal experience in the United States he described the introduction of social questions into the curricula of educational institutions and, in comparing the work of the British Social Hygiene Council with that of the analogous society in America, he pointed out that in both cases social hygiene meant social welfare, and the benefits to be derived were based upon the comprehension of sex. It became clear that Prof. Bigelow did not mean by the study of social welfare, concentration upon sexual problems, but upon family relations, the family being the expression of sexual activity. Society in America, he said, still regarded the family as a unit, the welfare of society being bound up with the safeguarding of that unit; and, alluding to the frequency of divorces in America, he found them not to prove opposition to the family unit idea but only unadaptability of the contracting parties, inasmuch as for the most part divorced people desired to marry again. While urging the inclusion of suitable biological instruction in the education of the young, he declared that the stories of misdemeanour at coeducational schools in America were grossly exaggerated, and said that whenever investigation had been made the untrustworthiness of the rumours had been patent.

ANNOTATIONS

APPLIED PHYSIOLOGY AND PSYCHOLOGY.

THE work of the London School of Hygiene and Tropical Medicine is far wider than its name implies, and brings it into intimate liaison with Government departments and other bodies. A little-recognised branch of its activities and one of great importance was described by Prof. Major Greenwood in a paper read before the Royal Society of Arts on Wednesday last—that is, its work for the immediate service of industry. The divisions of biochemistry, bacteriology, and medical zoology perform work of immediate value in improving processes of manufacture and soil conditions, but the work of the school towards the betterment of the hygiene of industrial conditions, while equally important, is much less widely appreciated. As Prof. Greenwood pointed out, the value of physiological research to labouring life is only just becoming apparent. The part which Sir Leonard Hill has played in applying the discoveries of the laboratory to the problems of the workshop will perhaps not be fully appreciated for a generation or so. It would be hard to exaggerate the increase of human comfort directly attributable to his simple katathermometer alone.

Moreover, the spirit of his investigations is far more important even than their result. Less than a generation ago the physiologist—in the words of Prof. Greenwood—was regarded as a rather unpractical person, much more interested in the twitching of frogs' muscles than the doings of men and women. The physiologist tended to despise the practical man and the practical man heartily returned the compliment. Sir Leonard Hill has taught that laboratory physiology is an instrument and not an end in itself, and that the proper ambition of a physiologist is to understand human physiology. It is the business of institutions such as the Keppel Street School, said Prof. Greenwood, to see that this liaison between the laboratory and the workshop shall never be broken. The number of trained investigators is still small, but the coördination of the school's work with that of the Industrial Health Research Board will increase it, and the organisation of the Medical Research Council has extended the liaison to branches other than those with which Sir Leonard Hill's name has been associated. The school has already secured one element of success in ensuring that entrants to the public health services receive a proper grounding in the applications of physiology.

The physiological aspects of industrial hygiene lead straight to the psychological aspects, which, according to Prof. Greenwood, have not yet found their Leonard Hill; they are equally important with the physiological aspects, and progress in one direction cannot be achieved without progress in the other. Fortunately, as Prof. Greenwood pointed out, the Industrial Health Research Board has realised this truth from the beginning and has devised a unique and highly promising combination of clinical and experimental methods of research. The school, for its part, has introduced the elements of clinical psychology into the curriculum for the Diploma of Public Health and has established a chair of medical and industrial psychology. Prof. Greenwood prophesies that the school will train workers whose efficiency as industrial psychologists shall not be inferior to that of the industrial physiologists. If its work in this direction is comparable with that which it has performed in other branches of hygiene and tropical medicine, there need be no anxiety for the future of this new and very important enterprise.

MASTOID COMPLICATIONS IN SCARLET FEVER.

Dr. Kaisig has written a review of surgical complications in scarlet fever,[1] from which we have singled out the mastoid complications because of their frequency and importance. There are, she says, two main types of mastoiditis, differing clinically and pathologically; a very acute malignant type with extensive necrosis of the mastoid and early spread to the sinus and meninges (two cases in five years), and ordinary mastoiditis, as seen in conjunction with other specific fevers (35 cases). The cases of the latter she subdivides into three groups: according to whether it occurs during the first two weeks of otitis media (Group A); between the second and sixth week (Group B); or after the sixth week (Group C). Of the 14 cases in Group A, half showed fever, tenderness over the mastoid with redness and œdema, but all healed entirely with conservative treatment. The results of early surgery are poor, and one is well advised to wait till the inflammatory process has lost some of its urgency. Indications for operation are: (1) five to seven days' existence of mastoiditis without improvement in spite of a good discharge of pus and good local treatment; (2) abscess formation—swelling behind the ear and sagging of the posterior meatal wall; (3) the onset of septic symptoms. In Group B conservative treatment is of less importance, and operation should be performed if there has been any aural discharge for three weeks without any sign of improvement, with good treatment, and with a temperature practically normal. If there has been fever, which cannot be accounted for by any other focus of infection, operation should be done earlier, preferably at the end of the second week, since cases are found in which no signs of bone disease are present for three weeks and then suddenly marked local symptoms appear, extensive destruction being found at operation. Operation is required in all the cases falling into Group C. Many authorities never advise a radical operation in scarlet fever, but obviously a perisinous or subdural abscess will never heal with conservative treatment, and intracranial complications are very likely. This was present in 4 of 27 antrotomies recorded by Kaisig. Other advantages are that healing is quicker and later complications are avoided.

HOSPITAL COÖPERATION IN LONDON.

THE London Voluntary Hospitals Committee, whose origin was described in our correspondence columns last week, has now been in existence for a year, and the Central Public Health Committee of the London County Council has acceded to its wish to be consulted at an early stage on all matters of moment. It has been agreed on both sides that the machinery of Section 13 of the Local Government Act of 1929 should be used for exchange of information to the advantage of both the public and the voluntary hospitals services. No occasion has yet arisen to call together the area or other committees by whom the Voluntary Hospitals Committee is elected, as the

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[1] Kaisig, E.: Monat. für Kinderheilk., 1931, xlix., 373.

London County Council decided at an early date to postpone the foreshadowed area organisation of their own services. The Committee has ascertained that there is no present likelihood of the Council departing from their existing practice of not making capital grants to voluntary hospitals. As regards maintenance, while the Council are not disposed to make grants for general maintenance, they are willing that payments for specific services required by the Council and rendered by voluntary hospitals to the sick poor should be continued, and that the application of this principle should be if possible extended. It will be remembered that this distinction was also drawn by Lord Cave's Committee. The Council have agreed to the Committee's request that as an interim arrangement contributions to voluntary hospitals of similar amounts to those contributed by the late guardians in 1929 should be paid for the year to March 31st, 1931, by the Council, on the understanding that the payments are without prejudice to whatever financial arrangements the Council may decide to make after that date.

The representatives of the Hospitals Committee at their last conference with the Public Health Committee urged that the Council should not insist on treating all patients chargeable to them if there were a choice of voluntary or Council accommodation. The Council took the view that it is their first duty to keep their own beds occupied, and that, while they cannot pay voluntary hospitals for services they can themselves supply, they adhere to the principle of grants for specific services rendered at their request. The provision of pathological laboratories at the Council's hospitals has been discussed with the Hospitals Committee. The Council have in mind as an ultimate ideal a well-equipped and adequately staffed laboratory in every general hospital, and one or more central laboratories for the specialised pathological work requiring expert knowledge and elaborate equipment. Their immediate proposals provide for the establishment of five "group" laboratories, suitably located, capable of dealing with the more specialised pathological work. The first of these "group" laboratories will be ready to function this month; two others will be completed in three or four months' time; the last two will be ready for use towards the end of this year. The late Metropolitan Asylums Board had already provided adequate laboratory services at the northern and southern "group" laboratories for the special hospitals, and also for the production of therapeutic sera at Belmont laboratories. The Committee agreed with the view that it was desirable to provide an adequate pathological service for every general hospital dealing with acute cases, and recommended that in the formation of "group" laboratories advantage should be taken of existing pathological departments of the voluntary hospitals, a suggestion which was not adopted.

At the desire of the Council the Hospitals Committee submitted a memorandum upon the use of municipal hospitals for medical education, and upon the methods of staffing at these hospitals. The appointment at municipal hospitals of resident house physicians and house surgeons would, it was pointed out, prove of value in the education of recently qualified men and women. Provision has already been made for such appointments. The Hospitals Committee also recommended that the present consultant services at municipal hospitals should be extended, and an advisory Board set up for the purpose of recommending consultants for appointment. The Council, however, decided to continue existing arrangements for a year and to reconsider them then. Opportunities for students to visit municipal hospitals for the purpose of studying diseases more often seen in those institutions than in voluntary hospitals are to be extended wherever possible. The shortage at teaching hospitals of obstetric beds for instructing medical students was discussed and the Council, while stating that the existing maternity units in their general hospitals were not of sufficient size to be suitable for teaching purposes and were fully used for the training of nurses, acquiesced in the principle of allowing the teaching of students in connexion with their maternity beds as and when satisfactory arrangements could be made. The Hospitals Committee also arranged two conferences with representatives of the Board of Control when the facilities provided by the Act were outlined for treating mental patients by voluntary hospitals.

BLOOD VOLUME AND CIRCULATION TIME IN BABIES.

AN interesting contribution to human physiology is to be found in the work of Dr. H. Seckel, in the Hamburg University Children's Clinic, on various aspects of the blood volume and circulation time in babies and young children. His latest paper[1] deals chiefly with circulation time and the minute-volume and stroke volume of the heart's output, forming a logical sequence to his previous studies[2] of total blood volume in normal and sick children from the early weeks of life up to 14 years. After a brief discussion of the various ways of investigating the circulation time in human subjects and the special disadvantages presented by most of them for pædiatric work, Seckel advocates the "histamine rash" method as most useful. In the doses he employs this substance is free from all risk, can be relied upon to produce reddening of the face, and has a purely local action on the capillary system. The total blood volume was estimated by a colorimetric method at the same time and the following represents a summary of the routine adopted.

All the children in the present series were young babies and the investigation was performed with the child fasting and lying quietly at rest. The exact number of heart beats for a full minute was counted by auscultation at the apex. Next, blood was taken from the heel for a hæmoglobin estimation and red-cell count. A red-cell count was also made in blood obtained from the longitudinal sinus and the colour-index and "red-cell volume" calculated. The volume of the circulating blood was then determined by injecting trypan-red solution into the longitudinal sinus, samples of blood being taken before the injection and at 3½ and 5½ minutes afterwards. Next, the blood volume was determined colorimetrically, as described in detail in Seckel's earlier papers. When this had been done, histamine was injected into the sinus in a dose of 0·001 mg. per kg. of body-weight, the solution employed being 1 c.cm. of a 1 : 1000 histamine solution in 100 c.cm. of Ringer's solution. The exact time of the beginning of a blush on the forehead was noted by two observers with stop-watches. One difficulty of this method lies in keeping the child quiet, because any screaming naturally reddens the face, but Seckel appears to have got over this in 90 per cent. of cases by "psychical diversion" or failing this, by use of the "dummy" or small feed.

In nearly 50 babies of from 1 to 15 months old, mostly quite healthy or slightly dystrophic, the average total circulating blood volume was approximately 8 per cent. of the body-weight. The circulation time, measured to the beginning of the appearance of the reddening of the skin, was about 15 seconds for the first year of life in healthy babies and this showed a remarkable constancy in certain cases where the experiment was repeated more than once. Seckel emphasises that he is describing the "minimum" circulation time by this method, for the "middle" or "mean" time referred to by other workers is approximately double this. This is important when the results obtained are used to calculate the minute and stroke volume of the heart. As Seckel points out, direct estimation of these factors is in practice quite impossible in babies, but the minute volume can easily be reckoned when the total blood volume and "mean" circulation time are known. The minute volume in the first year of life was found to lie between 160 and 170 c.cm. per kg. of body-weight, and in the second year round about 130 c.cm. as compared with an average for adults of about 75 c.cm. The stroke volume could likewise be calculated from a knowledge of the heart-rate and was found to be about 1·3 c.cm. per kg. The work performed by the heart can be shown by these figures to be relatively larger for these young infants than for adults. The very high figures for the size of the circulation in young babies seems to be directly associated with the intensity of the respiratory gaseous exchange at this age and represents the organism's response to the growing tissues' great need of oxygen. In severe anæmia, in fever, in pneumonia, and in congenital heart disease, for example, this mechanism breaks down, and Seckel is doing further work on blood volume and circulation time in these disorders.

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[1] Jahrb. f. Kinderheilk., March, 1931, p. 87.

[2] Ibid., 1929, cxxvi., 83; and 1930, cxxvii., 149.

WELFARE OF THE BLIND.

THE ninth report of the advisory committee on the welfare of the blind to the Minister of Health[1] gives the number of blind persons in England and Wales registered on March 31st, 1930, as 56,853. This is an increase of slightly over 4000 on the previous year, but the difference is probably due to improved registration or else to a more liberal interpretation of the necessarily somewhat vague definition of industrial blindness recognised. ("too blind to perform work for which eyesight is essential.") The report insists on the importance of obtaining proper medical evidence from practitioners specially skilled in ophthalmology before anyone is placed on the blind register. It may be suggested that even so the decision as to whether a particular applicant is or is not blind within the meaning of the Act is no easy one. There are many borderland cases and a degree of vision which may be quite useless for reading and writing may be of considerable service in other respects. It is not surprising that there should be a difference of opinion even among ophthalmic surgeons about such cases. Some would sign their certificates; others would not. There is a greater difference between such a case and one who is "stone blind" without perception of light than there is between a man who can merely count fingers with the best correcting glass and one who is just able to see 6/60 but finds it impossible to obtain any sort of employment on account of defective vision. Yet for the latter there is no State aid forthcoming while for the former there is much.

The report comments on the changes due to the Local Government Act of 1929 establishing a new system of grants and throwing upon the local authorities the duty of dealing with and subsidising the voluntary associations who carry out the work for the blind. A main part of this work consists in the provision and organisation of employment for blind workers. The proportion of the total blind population who are employed is 17 per cent. and the report states that there are large numbers of blind persons undergoing training now who will be ready for employment in the next few years. As there is considerable difficulty in disposing of the goods made it is maintained there is urgent need for the establishment of a central marketing board. A placement committee has been established by the National Institute for the Blind for the purpose of fostering the employment of the blind, especially in ordinary factories and workshops. It was found that the earnings (approximately 15s. a week) of blind workers employed in ordinary factories averaged about two-thirds of what sighted workers could earn in the same occupation.

MYELOID SARCOMA.

IT is becoming fashionable, and it is certainly convenient, to use the name "osteoclastoma" for the tumour which arises in the medullary cavity of bones and is composed of spindle cells with a good proportion of giant cells which resemble osteoclasts. It is generally considered a benign tumour and great numbers of cases have undoubtedly been cured by curettage or local removal. Evidence however accumulates that growths of this histological type cannot be trusted to remain indefinitely localised at their site of origin. In 1926 Drs. E. F. Finch and H. H. Gleave,[1] of Sheffield, published a very clear example of malignancy. A man of 49 had a spontaneous fracture of his femur in 1917. By 1925 the leg was useless and was taken off, and soon afterwards the patient began to spit blood. He died in 1926 with abundant secondary growths of typical histological structure in the lungs. Dr. S. C. Dyke, of Wolverhampton, has recently described another instance in the same journal.[2] A man of 25 had trouble in 1924 with his knee, supposedly following an injury. In 1925 the knee was explored and an osteoclastoma curetted from the patella. In 1929 after a fall the lower end of the femur swelled and the leg was amputated and by the end of the year he had signs of a number of secondary growths in the lungs and elsewhere. He died in 1930 and metastases were found in the scalp, lungs, kidneys, and mediastinal and peritoneal lymphatic glands; further secondaries appeared to be present in the ribs and spine but these were not confirmed histologically. The microscopical appearances of the secondaries in this case were not so typical, but among masses of necrotic and spindle-celled tissue small areas were found everywhere which had the classical structure of osteoclastoma. Yet a third case has been put on record[3] from St. Mary's Hospital by Dr. J. W. Orr. A man of 20 had his leg amputated for a growth of the lower end of the femur, diagnosed histologically as "myeloid sarcoma." He died six months later with many metastases in the lungs but not elsewhere. The secondaries showed a spindle-celled stroma with many typical osteoclastoma giant cells; there was, however, a certain amount of bone and a number of small giant cells bearing no resemblance to osteoclasts but suggesting foreign body cells. In another case, observed many years ago by Prof. Robert Muir in Glasgow, the secondaries in the lungs showed only spindle cells as far as they were examined. Some people may argue that, because the secondaries in some of these cases did not show an exactly typical picture, the tumours in question were not genuine *osteoclastoma.* This seems to be hardly a more reasonable position than to say that a tumour cannot be an osteoclastoma if it is malignant. Osteoclastomas will show a uniform and typical microscopical picture only so long as they are benign; with the onset of malignancy we should expect greater or less departure from the customary structure and should not be surprised if some cases, such as Dr. Orr's, show signs of kinship with osteogenic sarcomata. Clinically at any rate it seems certain that purely local treatment cannot be regarded as altogether safe.

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[1] H.M. Stationery Office. 1931. 6*d*.

[1] Jour. Path. and Bact., 1926, xxix., 309.
[2] Ibid., 1931, xxxiv., 259.
[3] Ibid., p. 265.

THE VETERINARY BULLETIN.

THE Imperial Agricultural Research Conference of 1927 recommended the publication of a veterinary bulletin by the Imperial Bureau of Animal Health, a task previously undertaken by the Bureau of Hygiene and Tropical Diseases. The *Tropical Veterinary Bulletin* accordingly was discontinued with the issue of Dec., 1930, and in its place a new journal under the title of the *Veterinary Bulletin* is to appear quarterly, the first issue of which is in our hands. It will deal with all aspects of animal health in so far as they relate to original research and administrative control, but will not deal with clinical material from the point of view of the practitioner. The ground covered will be wider than that of the bulletin whose place it has taken, for the animal diseases of temperate climates will receive full consideration, as well as such cognate matters as mineral and plant poisoning in animals. This first number contains 96 pages admirably arranged and printed but for the fact that the line is more than 5½ inches long and would certainly not have passed the censor of the Fatigue Board. The German titles are, with a few trifling exceptions, correctly rendered. The bulletin consists of a series of 168 readable abstracts and reviews classified under 14 headings, the longest section being diseases caused by bacteria and fungi, followed by protozoan and metazoan parasites, and filtrable viruses. A useful section summarises the many official reports which the veterinarian should know about. The editor of the bulletin is Mr. W. A. Pool, M.R.C.V.S., deputy director of the Bureau. The bulletin will be issued on the first day of April, July, October, and December, to subscribers at £1 for the volume or 7*s.* 6*d.* for a single copy. Application to the Imperial Bureau of Animal Health Veterinary Laboratory, Weybridge, Surrey.

MENTAL HOSPITALS IN AMERICA.

WITH the passing of the Mental Treatment Act, 1930, all "asylums" automatically became potential centres for the dissemination of mental hygiene and, no doubt, they will before long become mental hospitals in the truest sense of the word. The speed of their development along these lines must, however, depend upon the education of public opinion. Apart from these statutory institutions the hospitals which have been specially established for the early treatment of nervous and mental disorder and which enjoy the confidence of that large proportion of the population which still dreads the "taint" of "insanity" can be counted on the fingers of one hand. This is one of the things in which America has progressed beyond us. In its special hospital number for March the *Journal of the American Medical Association* publishes an analysis of hospital services in the United States; the figures show the astonishing result that the hospitals classed as "nervous" and "mental" far outnumber, numerically and in the number of their beds, hospitals of any other class except general. New York State alone has 59 mental hospitals; in the whole of the States there are 4302 general hospitals serving an average of 240,000 odd patients, and 561 nervous and mental hospitals serving an average of 415,000 patients. The next in the list are the tuberculosis hospitals, which number 515 and serve 56,000 patients. These figures prove conclusively that the American people are far more alive to the necessity for mental hygiene than we are. The article quoted indicates a demand for accommodation in mental hospitals comparable to our own, for 94·8 per cent. of the available beds are occupied, as against 64·7 per cent. of the beds in general hospitals. Government and non-Government hospitals have grown up together in many States. The Americans are making increasing use of their mental hospitals for teaching purposes; 31 out of 561 are affiliated with medical schools, and 63 offer 302 approved residencies in psychiatry. The report of our Board of Control for 1929 states that at the beginning of 1930 the number of persons under care for notified mental disease in England and Wales was 142,387; the proportion of persons under treatment to the population is therefore smaller in the United States than in England in the proportion of about 9 to 10, reckoning the population of the States as 130,000,000 and that of England and Wales as 40,000,000. These rates illustrate the crowded state of our mental hospitals which is constantly deplored by the superintendents. They claim that they cannot do their preventive and early mental treatment properly unless they have much more accommodation.

PHYSIQUE AND FEEBLE-MINDEDNESS.

THE existence of physical abnormalities in mentally defective people is familiar even to the layman, and much has been written about so-called stigmata of degeneration. Many early ideas on this subject were unscientific because the study of physical constitution was undeveloped. Recent work, however—especially the researches of Kretschmer and his pupils—has rendered possible a more accurate and refined investigation.

Dr. Eric Strauss, in a paper on the Psychobiological Constitution of the Weak-minded,[1] makes a well-balanced and stimulating contribution to a subject of importance not only to the doctor but also to the eugenist and the sociologist. His material consisted of 110 male defectives who superficially presented an appearance of physical normality. He thus excluded from consideration all the grosser types of psychophysical deficiency such as cretins and mongols, syphilitics and epileptics. He sought first to discover whether these 110 defectives could be grouped according to Kretschmer's classification of physical constitution in the three primary categories of leptosomatic, pyknic, and athletic. None exhibited the typical characteristics in an *uncontaminated form* and 11 were so dysplastic that they could not be classified at all. The remainder, though recognisable as belonging to one or other of Kretschmer's groups, exhibited various physical abnormalities of which genital dysplasias were the most frequent and striking. As might have been expected, there is little evidence that any single physical type predominates among mental defectives.

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[1] Jour. Ment. Sci., 1930, lxxv.

Strauss's most interesting observations are concerned with the temperament of defective patients. As is well known, Kretschmer associates certain temperamental characteristics with his physical types. Strauss found, however, that this association was by no means constant among the defectives. In spite of the small number of pyknics among his 110 patients, the corresponding cyclothymic-cycloid temperament appeared in no less than 31 per cent. His explanation of this apparent discrepancy is based upon a theory of the evolution of temperament which deserves to be read in full. Briefly, he considers that the cycloid mental characteristics exhibited by the defectives represent a primitive temperamental type, an arrest in emotional development comparable to their physical and intellectual stunting. Dr. Strauss's paper also contains material bearing upon the frequency of the physical "stigmata" of mental defect, upon its heredity, and upon its association with criminality.

FRESH LIGHT ON JOHN ABERNETHY.

A MEETING of the Abernethian Society of St. Bartholomew's Hospital was held on April 20th to commemorate the centenary of the death of John Abernethy. Sir Arthur Keith, who was introduced by the President of the Society as a hero-worshipper of its founder, delivered an address with the title "Fresh Light on John Abernethy." "Just 100 years ago," he began, "my predecessor, William Clift, Conservator of the Museum of the Royal College of Surgeons, opened the 'Daily Remembrances' I hold in my hand, and entered under the date, Wednesday, April 20th, 1831, 'Mr. Abernethy died this day at half-past 5 P.M. at Enfield, Middlesex.'" On April 23rd "called upon Mr. Chantrey concerning Mr. Abernethy's death" and there follows a priced list of one pot of pomatum; plaister-of-Paris, a bag; two iron spoons; one small tool, and the record of a visit to Enfield. There Clift "was much gratified in being made certain that a cast had been made . . . when our friend was in the prime of life and includes the intire head and beginning of the neck." So are explained references to Abernethy in Clift's diary and particularly why Clift was so keen to secure from Chantrey a bust of his friend, and said Sir Arthur for himself, "it was while rummaging in Clift's diaries and being made to see Abernethy through Clift's eyes that the great surgeon of St. Bartholomew's became also a hero of mine." Telling much of the life-story of Abernethy, and of how Abernethy and Clift came together over the business of the Hunterian Museum, the lecturer reached the day when Abernethy felt compelled to retire from his seat on the college council. Before doing this he sent for Clift, and together they drafted the letter of resignation. The council decided to acknowledge Abernethy's merits in a suitable resolution, and Clift had much to do with its drafting. In its final form it contains a curious and puzzling phrase: "the contemplation of his bust must ever excite in liberal minds, emulative ideas of public virtue in the cultivation of useful knowledge." This written before a bust had been executed, explains Clift's hurried visit to Enfield after Abernethy's death. Sir Arthur Keith described Abernethy's house, Field Manor, Enfield, still standing, as it would have looked on the day of the funeral, and after touching on the revolution that has occurred in science during the last 100 years, closed with the following words: "We can never see Abernethy as his contemporaries saw him. The lesson that I would take out of that is—that what has happened to Abernethy's discoveries will happen to all of ours. Treat, then, our great dead with reverence. But there is one side of a man's nature which can never grow old—never pass out of date or fashion. That is his character. Abernethy as a man will never be out of date." A vote of thanks proposed by Sir Percival Hartley was seconded by Mr. W. R. Bett, who addressed the lecturer in the manner first of Sir James Paget and then of John Hunter. Lawrence's portrait of Abernethy, and Grove's bust had been placed in the lecture room, where also was an exhibition of Abernethiana arranged by Mr. J. M. Jackson, including Abernethy's gold repeater watch lent by the Royal College of Surgeons.

RELAPSING FEVER IN G.P.I.

AT a meeting of the Société de Thérapeutique of Paris Dr. Auguste Marie lately recorded his observations on 51 cases of general paralysis treated by inoculation of relapsing fever. The method, which had been suggested to him by Prof. Mesnil followed by Dr. Marchoux and Dr. Levaditi, was first employed in cases of general paralysis refractory to malariotherapy, in advanced stages where inoculation of the plasmodium was likely to be dangerous, and in cases where a rapid reaction was required. Inoculation of relapsing fever was also used as a method of prophylaxis against relapses in patients who had been inoculated by malaria and seemed to be immune to the plasmodium. The result of the treatment was that 18 of the 51 patients were discharged with a more or less complete and persistent remission; 16 showed an arrest of their physical symptoms but were detained in the asylum where some of them had been for several years; there were 17 deaths, 10 of which occurred within a few months after the treatment; and in the remaining cases there were remissions of varying duration. The average age of the patients who were discharged was 35 years, of those detained in hospital 40 years, and of the fatal cases 45 years. This suggests that with relapsing fever as with malaria the best results may be expected in young subjects. Some authorities think that relapsing fever is better tolerated by general paralytics than malaria, although there is not always a reaction. Hoche even maintains that the number of remissions is more frequent with relapsing fever. On the other hand, some observers who have tried both methods, such as Prof. Claude, still prefer the plasmodium of malaria to the spirillum of relapsing fever. Marie himself thinks that treatment by relapsing fever is a less reliable and more complicated method than malariotherapy, because after four to six passages from man to man the spirillum must be passed again through the mouse, whereas the plasmodium retains its virulence. In conclusion, he recommends that both methods should be supplemented by courses of arsenic or bismuth.

THE St. Cyres lecture for 1931 will be delivered by Sir Thomas Lewis at the National Hospital for Diseases of the Heart, Westmoreland-street, London, W., at 5 P.M., on Thursday, May 14th. His subject will be Ischæmia of Muscle as a Cause of Anginal Pain.

IT has been brought to our knowledge that half a gramme of radium element of guaranteed quality, set up in needles of various strengths, is in the market for disposal. Any request for further particulars will be passed on to the vendors.

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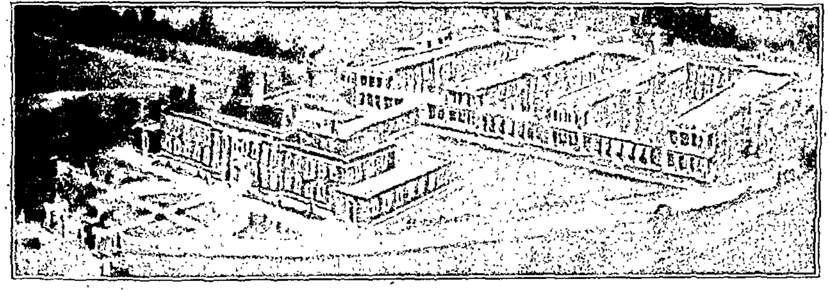
[1] Bull. Soc. de Thér., March 11th, p. 116.

SPECIAL ARTICLES



King George Hospital as it will appear when completed.

KING GEORGE HOSPITAL, ILFORD.

It is an ironic comment upon much of the current talk about the coming "bankruptcy" of the voluntary hospital system that at the very moment when the primary responsibility for the provision of hospital services has been placed upon public authorities we are witnessing the rapid creation of a great new voluntary institution for the prevention and cure of disease. The building and equipment of a large general hospital is a very serious undertaking even when, as at Ilford, there is a nucleus to work upon, and it is easy to understand why the London County Council preferred to leave to voluntary effort the provision of so essential an accompaniment of their vast Becontree housing estate. One of its ex-chairmen, Sir George Hume, has given the enterprise his blessing; another ex-chairman, Sir Cecil Levita, has been its moving spirit.

King George Hospital has just completed its first year since the grant of a charter of incorporation, and the report of the board of management records a period of great activity and substantial progress not only in building but in increasing the volume and extending the scope of the work. The board has to cope with a demand which grows more rapidly than the means of answering it. As yet the accommodation is small, and a year ago it became necessary to plant out a part of the nursing staff to provide the additional beds for which the need was "desperate." The average of patients resident daily was thus increased from 55 to 67. Their average stay slightly exceeded 19 days and their weekly cost was £3 4s. 2d.

The original intention was to provide approximately 150 beds, but "the irresistible public demand" has compelled the board to move in advance of their means and to increase the number to 200. By making this extension while the builders are on the spot there has been a very large economy, the 50 additional beds costing no more than £240 each. This provident management ought to meet with its reward in the raising with comparative ease of the £25,000 which will still be required to enable the new hospital to be opened free of debt.

There could be no clearer proof of the need of hospital accommodation at Ilford than the fact that what is at present a small institution last year treated 131 more in-patients than in 1929, and that the number of out-patients rose from 2382 with 8427 attendances, to 4004 and 12,430 attendances. The Becontree centre, at Dagenham, an adequate modern building provided largely by the London County Council and local effort, is proportionately equally busy, and the usual public health services—school, antenatal, and infant welfare clinics, and a tuberculosis dispensary—have already been established. It is hoped that when the hospital is completed it will be opened by the King in person.

SWEEPSTAKES AND HOSPITAL POLICY IN IRELAND.

(FROM OUR DUBLIN CORRESPONDENT.)

It has been interesting to watch the changing attitude of the public in Ireland toward the policy of raising funds for hospitals by means of sweepstakes. When the plan was mooted first, the man-in-the-street thought that one or two such enterprises might succeed in freeing the hospitals from their more pressing difficulties, but not even the promoters dreamt of the huge sums that were about to roll in. The success of the November sweepstake startled the ordinary observer into interest, and the greater success of that held last month appears to him to indicate that untold wealth is at the call of those who gain sanction to promote a sweepstake for any object. The success of these two ventures has had its effect also on the minds of many governors of hospitals who had doubts a year ago about the wisdom of joining in what appeared to be a risky enterprise.

The vanishing of doubts has shown itself by the rapidly increasing number of hospitals participating in successive sweepstakes. Of the 13 major Dublin hospitals (ten general and three maternity) only three were concerned in the November sweepstake. Only five are standing out of the forthcoming ventures. Moreover, several provincial hospitals are now participants, and legislation is about to be introduced to the Dáil to legalise the county (rate-supported) hospitals to join in later sweepstakes. Again, all kinds of other ventures are asking for their claims too to be considered, that it may be made legal for them to raise funds by sweepstakes.

EFFECT ON ORDINARY SUBSCRIPTIONS.

It is not easy to say how far the governors of the hospitals which are still standing apart are influenced by questions of principle—or by mere considerations of expediency. There is no doubt that many individual governors feel strong disapproval of gambling. Some others, while disliking gambling, are questioning themselves as to whether they are right in putting their personal moral judgments as obstacles to the pecuniary benefit so easily attainable for their hospitals. A few subscribers, who disapprove of gambling, have transferred their support from the participating to the non-participating hospitals, as has also the Dublin Hospital Sunday Fund. On the other hand, many who occasionally subscribed to the hospitals as charities, but were not particularly interested in the work, are fastening up their purses in the comfortable belief that the participating hospitals no longer need their help, and that the non-participating hospitals could become equally independent, if they were willing to divest themselves of foolish scruples. In the result, none of the hospitals—participating or non-participating—is in a position to judge where it stands as regards its future income from the charitable public.

DOUBTS.

Nevertheless, although the man-in-the-street is content with the obvious fact that the hospitals are getting money easily, there are many more thoughtful observers who regard the method as unsound, morally or economically or both, and do not look with equanimity on the prospect of the burden of the care of the sick poor of Ireland becoming a charge on the gambling spirit of the world. In particular, it is urged in many quarters that the proposal now before the Dáil to permit certain rate-supported institutions to share in the benefit of the sweepstakes is humiliating and improper. If the natural responsibility of the rate-payer as regards public hospitals is transferred to the gambler in China or Peru, then it becomes difficult to know where to draw the line. Why not put the whole maintenance of the hospitals on the sweepstakes? Or the charge of the salaries of medical officers of health? Or the upkeep of the roads? Why not go further, and support the Government of the country itself on sweepstakes, as certain of the minor princes on the continent draw their incomes from their gaming tables?

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

THE FOUNDATIONS.

IN a country where even the most limited proposals for federal aid to health work arouse active opposition—especially from the medical profession—the work of the endowed foundations in promoting and forwarding public health research and administration becomes of really national significance. Reports of four of the leading funds [1] are recently to hand. The *Milbank Fund* announces the termination of the three health demonstrations in New York State. These demonstrations have now been in progress for eight years and may be considered to have fulfilled their purpose of demonstrating in a rural, a town, and a metropolitan area respectively something of the possibilities of an intensive public health campaign. The results achieved in the rural demonstration in Cattaraugus County are reviewed in a book (now in press) by Prof. C. E. A. Winslow.[2] Dr. Winslow agrees that the county demonstration, like other human enterprises, failed to achieve perfection, but says that "it was conceived with remarkable soundness and in the main executed with efficiency and economy" and "represents one of the most effective and inspiring contributions made to the cause of rural public health anywhere in the world." He finds that as a result of the eight years' public health work the county is saving 20 infant lives, 5 lives from diphtheria, and 14 lives a year from tuberculosis. In these three classes alone he estimates the gain to the community at $300,000 a year. It is evident that the County Board of Supervisors have also been convinced that health work pays, for despite the general financial retrenchment they have increased their appropriations for public health from $66,000 in 1930 to $87,000 in 1931.

A similar critical review of the demonstration in the city of Syracuse is contemplated. It is roughly to be measured by the achievement of a low infant mortality-rate. This reached a minimum of 55·7 in 1929. The estimated rate for 1930 is approximately the same. The municipality, which appropriated $144,000 for public health in 1923 (the first year of the demonstration) appropriated $314,000 for the same purpose in 1930.

References have already been made in these letters to the work of the Bellevue-Yorkville health demonstration in the metropolis. The immunisation of over 200,000 city children against diphtheria is not the least among its accomplishments.

The *Rosenwald Fund*, founded in 1917 "for the well-being of mankind," has been expended mainly for educational and health work among the negroes. The fund is coöperating with the U.S. Public Health Service and State authorities in five experiments in the control of syphilis. Aid has been given in placing 31 coloured nurses in southern county health units. Hospitals and institutions for coloured people have also benefited, including a negro birth-control clinic in New York City. "In all these activities in behalf of negro health a most important feature is coöperation between white and coloured groups in financial support, management, and medical direction. In so complex a subject as medicine" writes Mr. Embree, the president, "negroes must for many years lean heavily on the superior training and longer experience of their white colleagues."

The *Rockefeller Foundation* specialises in giving assistance to official health agencies both in this country and abroad, and also in the encouragement of promising research workers by the giving of special grants and of fellowships. During the last year governments in various parts of the world have received aid for purposes of public health education, for the strengthening of central and local health services, and in the scientific study of their public health problems. During 1930, 52 articles in the medical press reported work done by members of the field staff or persons working under the auspices of the Foundation. Work on hookworm disease is in progress in 14 different countries, on malaria in 15 countries as well as in the United States. Research on yellow fever is still a major interest of the Foundation. It cost the life of one of the younger and most promising of research workers, Dr. Theodore B. Hayne, who died at Lagos, Nigeria, on July 11th, 1930.

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[1] Milbank Memorial Fund Quarterly Bulletin, vol. ix., January, 1931. Julius Rosenwald Fund, Review for the Year, Chicago, 1930. The Rockefeller Foundation: Quarterly Bulletin, vol. iv., January, 1931. The Commonwealth Fund: Twelfth Annual Report, New York, 41, East 57th-street, February, 1931.

[2] Health on the Farm and in the Village. By C. E. A. Winslow, professor of public health, Yale Univ. School of Medicine. New York: The Macmillan Co. Pp. 275. $1.

The *Commonwealth Fund* has three broad interests: Public Health, Mental Hygiene, and Anglo-American relations. The public health work done with its aid is somewhat like that carried through by the Milbank Foundation. However, it has concentrated more upon the education in public health of the medical profession and has been spread over a larger territory. In each of the States in which the Commonwealth Fund is assisting to develop public health service "to the point of greatest usefulness within the limits of sound budgeting," 15 scholarships are provided annually for rural physicians who will receive post-graduate instruction not only in public health but also in the various fields of medical practice. Scholarships for post-graduate nursing study are also provided.

During the academic year 1929–1930 60 English fellows were in residence in American universities. During the present academic year the number is 68. Very interesting reports are furnished by these fellows of their experiences in America. The summer travel which intervenes between the two years of university life is rightly emphasised as an important feature of the plan.

In mental hygiene the fund has been active in the promotion of child guidance clinics and in securing for them the right kind of trained personnel. Their assistance in developing the child guidance clinic in London has doubtless made this phase of their work familiar to English readers. The new London house of the Commonwealth Fund is at 35, Portman-square.

PUBLIC HEALTH SERVICES

REPORTS OF SCHOOL MEDICAL OFFICERS.

—	No. on roll.	Average attendance.	Routine inspections.	Special exams. and reinspections.	Percentage of defects.
Sheffield . . .	76,949	70,224	19,128	138,882	16·76
Eccles	—*	—*	1,978	3,189	21·28

* Not stated.

Sheffield.

Dr. T. Chetwood says that the record of the past year shows continual improvement in the health of the school-child in the city. It must not be forgotten, however, that the real object of the service must be prevention of disease rather than its cure. Of the children under 5, only those few who attend the nursery schools have the benefit of the school medical service, and it is apparent, he adds, that many of the problems that face the school medical officer originate among the children of pre-school age. The expansion of the service is illustrated by the increase of nearly 30,000 in clinic attendances, mainly due to the extension of the dental facilities and to a rapidly growing number of minor surgical dressings, of which both parents and teachers are eager to avail themselves. Routine dental inspection is now carried out in 122 out of 137 schools This has been rendered possible by augmentation of the dental staff which now numbers eight dental surgeons with the necessary assistants (this gives one dentist to about 9500 school-children), and a new branch clinic opened at Heeley last May. A special feature in Sheffield is the extension of facilities for children actually suffering from toothache and the large use made of them. This scheme is seemingly in contrast with the policy of some other large towns, such as Hull, where casual treatments are being eliminated and attention concentrated on prophylactic work. Dr. Chetwood notes that the percentage of parents accepting treatment for their children was five more than last year; the present figure of 58 per cent., he says, is better than in some other large areas. An activity more nearly preventive in character is the rheumatism scheme which is to be considered in Sheffield at an early date. An outstanding event of the year was the opening of the new open-air school at Bents Green with 50 resident children and 100 day scholars. Children are transferred from the residential to the day school; the improvement in health is shown especially in a higher standard of nutrition, of skin condition, and of cleanliness. The proportion of children in nursery schools may as yet be small, 270 places for 98,447 children of school age, but the results are such as to encourage the hope of rapid extension. This report lacks the accounts of special investigations which were formerly such an interesting feature of Dr. Chetwood's record.

Eccles.

Dr. J. E. Spence directs his glance over the child's whole school life and backwards to its need for care before coming to school. The close coördination of the infant welfare and school medical work has been maintained, and continuous supervision exercised from birth up to the school-leaving age; the two services are in fact unified in Dr. Spence himself. There are no nursery schools in the borough, but 586 children between the ages of 3 and 5 were in attendance at elementary schools. All the facilities of the school clinics are available for infants and toddlers; during the year there were referred from the infant welfare centre 45 cases of minor ailments, 20 for squint and defective vision, and 37 for toothache. A special inspection was made by Mr. Harry Broughton, L.D.S., of 119 children aged 5, to ascertain what advantage, if any, was to be gained by earlier routine treatment—i.e., beginning at 5 instead of 6. Of this sample 63 per cent. were found to need treatment, and the support of the parents was satisfactory. At the age of 5 the treatment needed is not generally extensive, and the advantages of improved general health and freedom from pain and disturbance are great. Earlier inspection would no doubt facilitate the orthodontic work on which Mr. Broughton spends much care. Orthopædic treatment is being developed in a scheme by which children are dealt with at the Irlam clinic of the Lancashire County Council, to which they are conveyed, if necessary by ambulance, in charge of one of the school nurses. They are there seen by Mr. E. S. Brentnall, under whose supervision remedial treatment is carried out, those requiring prolonged hospital treatment being sent to the orthopædic hospital at Biddulph; minor operations are done at Ancoats Hospital. Out of 30 children taken to the clinic, 9 were under school age. A frequent source of deformities is infantile rickets which might have been avoided if the parents had made better use of the welfare centres, but it is difficult to convince parents of the need for early treatment when their other children had bow legs and "grew out of them." A similar attitude is equally a hindrance in the case of impaired vision and stammering. It seems strange that in a time of depression like the present, when employment is difficult to obtain for the normal child, parents fail to realise what a poor chance there is for those with a disability. There is in Eccles a stammering class which does excellent work and could do more with parental coöperation. Dr. Spence wishes that the children themselves should realise their handicaps and so be led to get quit of them, but most teachers are anxious of the sense of inferiority felt by the child who dwells on his own disability.

Soke of Peterborough.

Dr. Christopher Rolleston mentions the experiment of inviting parents to bring their younger children, who in other areas would be dealt with at infant welfare centres, to be examined at the school inspections. The plan was good but, unfortunately, the response was small. Good progress has been made with the scheme for dealing with tonsils and adenoids, 38 children in the last twelvemonth, compared with 12 in the previous. Five were operated on privately, making a total of 43 receiving treatment out of 101 needing it, a proportion smaller than that for the country as a whole, which is 55 per cent. It should be noted, however, that the percentage of children considered to need treatment in the Soke is high—10·5 compared with 6·6 for England and Wales; thus it is probable that quite as large a proportion of the obvious cases were dealt with in this area as elsewhere. Dr. Rolleston gives his reasons for attaching importance to the presence of tonsils and adenoids: deafness and earache were common; in 70 per cent. definite changes were seen in the drum of the ear; malnutrition, rheumatism, and pigeon-chest were found, and, above all, mental retardation. In dental work again there is evidence of a high standard of ascertainment: every child in the Soke was inspected and 80 per cent. were found to need treatment, compared with only 56 per cent. inspected and 68 per cent. of them deemed to need treatment in the country as a whole. But in the Liberty of Peterborough the percentage of acceptances was low: 45 against 59. Both with adenoids and with dental decay Dr. Rolleston thinks the failure to accept the facilities is mainly due to the children; "the modern child," he writes, "rules its parents with a rod of iron, and if the coöperation of these juvenile tyrants could be secured, the statistics would be enormously improved." Dealing with results, he observes: "If, however, dental inspection and treatment are carried out annually, the parents can be told that the children, when they leave school, will have sound teeth, but, unfortunately, when they leave they do not enter upon the National Health Insurance scheme for another two years, and it is another two or three years before they are entitled to dental benefit, so that a large proportion of the good work of the school dental service is undone." Of the teaching of hygiene, he paints a gloomy picture: "Generally speaking, no definite time is assigned to this teaching, nor are the children held to share in the responsibility for the care of ventilation and cleanliness of class-rooms and the proper conditions of lavatories and playgrounds. What are the results of this neglect? In the first place the children do not appreciate that disease and even death are conveyed by uncleanly habits. . . . From all this neglect come outbreaks of infectious disease and much chronic ill-health, while the provisions for medical and dental treatment are not appreciated." Here as elsewhere in the report Dr. Rolleston's frankness is devoid of offence, for his concluding words contain an expression of thanks to teachers for the interest they show in the physical well-being of their scholars.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED APRIL 11TH, 1931.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 177; scarlet fever, 1480; diphtheria, 844; enteric fever, 35; pneumonia, 1410; puerperal fever, 48; puerperal pyrexia, 109; cerebro-spinal fever, 73; acute poliomyelitis, 1; acute polio-encephalitis, 1; encephalitis lethargica, 16; dysentery, 2; ophthalmia neonatorum, 81. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on April 14th–15th was as follows: Small-pox, 100 under treatment, 7 under observation (last week 221 and 5 respectively); scarlet fever, 1223; diphtheria, 1602; enteric fever, 36; measles, 136; whooping-cough, 454; puerperal fever, 27 (plus 14 babies); encephalitis lethargica, 129; poliomyelitis, 2; "other diseases," 18. At St. Margaret's Hospital there were 17 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was one death from small-pox, none from enteric fever, 64 (1) from measles, 8 (3) from scarlet fever, 39 (7) from whooping-cough, 27 (9) from diphtheria, 40 (8) from diarrhœa and enteritis under two years, and 175 (20) from influenza. The figures in parentheses are those for London itself.

The death provisionally classified to small-pox was assigned to Stepney (metropolitan borough). Only 4 deaths from meningococcal meningitis occurred in London, 1 from 1–2 years, 2 from 25–35 years, and 1 from 35–45 years. Seventeen fatal cases of measles were reported from Liverpool, 16 from Birmingham. Manchester reported 5 deaths from whooping-cough, Sheffield 3. Diphtheria claimed 4 victims at Liverpool. Diarrhœa accounted for 5 deaths at Liverpool and 4 deaths each at Stoke-on-Trent, Birmingham, and Salford. The 155 fatal cases of influenza outside London are scattered over 60 great towns: 15 were reported from Birmingham, 8 from Sheffield, no more than 6 from any other large town.

The number of stillbirths notified during the week was 318 (corresponding to a rate of 47 per 1000 births), including 60 in London.

DEATH CLASSIFIED TO SMALL-POX.

The death mentioned above, provisionally classified to small-pox, was that of a female infant, aged 7 days, which occurred on April 1st, the cause of death being certified as "inanition, small-pox in utero." Dr. Julia M. Browne, medical officer of health for Stepney, informs us that the infant's mother was removed to hospital with small-pox on Dec. 13th last and was discharged on Jan. 7th. The child was born on March 25th almost moribund—a small, poorly developed baby, with a sodden, unhealthy looking skin. There were one or two marks on the chin and elsewhere which could by reason of their character be reasonably attributed to small-pox occurring in utero. Dr. Browne adds: "It seems to me that the mother contracting small-pox three months before the birth of the child precludes the possibility of small-pox in utero being the immediate cause of the death of the child."

CONTRIBUTORY SCHEME FOR ADDENBROOKE'S HOSPITAL.—The governors of Addenbrooke's Hospital, Cambridge, last week adopted a contributory scheme prepared by the general committee of the hospital and the committee of the Cambridge and district workers' hospital fund. The scheme is divided into two sections. One covers the borough of Cambridge and will be administered by the workers' fund; the other will cover the whole of the rest of the area served by the hospital and will be administered by the governors. There will be a maintenance charge for both classes of non-contributing patients, letters of recommendation will no longer be necessary, and a paid almoner is to be employed. It is expected that the scheme will be in working order by October next.

REOPENING OF TENBURY HOSPITAL.—The decision, which was arrived at in November, 1929, to close Tenbury (Worcestershire) cottage hospital and sell the building and equipment has now been rescinded. Meetings to ascertain local opinion had a very favourable result, and it is estimated that a contributory fund of £800 will be available, and the help from other sources will bring the total income to about £1200 which it is thought will suffice to maintain all the activities of the institution. It is proposed to provide a medical service to include the treatment of patients in their own homes by district nurses, treatment at Tenbury Hospital, and, where necessary, at Worcester, Kidderminster, and other large hospitals.

CORRESPONDENCE

THE POST-GRADUATE HOSPITAL AND SCHOOL.

To the Editor of THE LANCET.

SIR,—The advent of a satisfactory centre for post-graduate medical education in London has advanced a stage further. Even if all cannot entirely share the optimism of the Minister for Health which prompted him to describe the institution of the post-graduate hospital and school as "perhaps the biggest single step taken since the war in this country in the interest of public health"[1] yet we may certainly believe that the conclusion of the preliminary labours of the organising committee and its entry on the task of setting up a governing body of the hospital do really foreshadow a centre for post-graduate education on a large scale, such as many, including THE LANCET, have for years worked and pleaded for. Mr. Greenwood's hopes can be shared even if we are a little shy of his sanguine expectations, for there are difficulties which may beset and obstacles which may oppose that consummation which the Minister of Health and the medical profession in common hope to witness.

Why has post-graduate education in London hitherto been but a partial success and why should it be more satisfactory in the future? In order to answer these questions convincingly we must first decide at what exactly this education will aim, or to put it more correctly what kind of post-graduate students do we hope and expect to attract? If, as some who have written on this subject appear to believe, the authorities hope and expect to compete with Vienna and Paris and Berlin in attracting medical men from all over the world, then, I am sure, many will agree with me and regard such expectations as ill-founded. There is at least one overwhelming reason which makes it impossible for London to compete with continental capitals in a worldwide appeal to post-graduates. What the post-graduate values above all is the opportunity to do for himself those things which he has not yet had the chance of doing. It is not enough that he should listen to lectures on, or even witness demonstrations of, the new methods of diagnosis and of treatment of which he has probably already read. It is the actual carrying out of these manœuvres, after due instruction, which is the most valuable contribution that post-graduate courses can offer him. Now this is where the continental method has an insuperable advantage over the British. In the clinics of Vienna, for example, patients are available for the eager, if unpractised, hands of the post-graduate learner to an extent which our notions of what is due to the patient's feelings and well-being render impossible here. Therefore the British post-graduate school cannot offer the facilities, let us say, for learning to use an endoscope or for carrying out gynæcological examinations or minor operations, that are put at the post-graduate's disposal in almost infinite quantity by the great clinics abroad. Hospital departments, with us, exist primarily for the benefit of the patients, but post-graduate centres abroad exist primarily for the benefit of the students. This British disability, admirable though its cause, is bound to prevent our post-graduate school from entering into exact rivalry with the great European centres by attracting foreigners, or even our own men from overseas.

As far as success for our post-graduate school rests on the support of our own doctors the answer depends on the quality of the opportunities offered, and here, no doubt, in buildings, equipment, clinical material, and the personnel of the teaching staff, the new hospital and school will provide all that the most exacting could demand. The Government are obviously generously disposed so far as financial endowment is concerned. Why, then, doubt for a moment the extent to which medical men in these islands will avail themselves of a fine opportunity for refurbishing from time to time their knowledge and skill? The answer lies, of course, in the exigencies of the practice of medicine. It is no easy matter for the practitioner, especially if practising single-handed, to leave his practice to undergo a course of post-graduate instruction; many find it none too easy to make the annual break which considerations of health and of family render almost imperative. For those who have partners the difficulty is, of course, much lessened. Unfortunately, it is the man who practises single-handed who may feel most keenly the need of either "refreshing" or new special instruction.

It is a splendid thing that a great post-graduate centre is to commence its activities in the metropolis, but its institution brings difficulties alike in the selection of the staff and the recruiting of the students, other than those who belong to services where facilities for study leave are provided.

I am, Sir, yours faithfully,

SIMPLICITAS.

April 20th, 1931.

UNDULANT FEVER IN SHIPS.

To the Editor of THE LANCET.

SIR,—I would like to thank Fleet-Surgeon Home for drawing my attention to the mysterious epidemic of fever in H.M.S. *Thalia* which had escaped my notice when searching the naval records of 1883. This epidemic is better evidence than any I gave in the Milroy lectures, that brucella infection in ships was often transmitted directly from man to man and not by milk. The *Thalia* was carrying out relief crews to ships in China; she obviously embarked *Br. melitensis* when she touched at Malta. Undulant fever continued to spread in the *Thalia* till she arrived at Hong-Kong, and in the ships of the China squadron, to which she transferred her drafts. Listen to this description of "*Thalia* fever": "The temperature generally remained high up to the fourteenth day when it commenced to fall sometimes to normal . . . . after a period of normal temperature a relapse occurred without any indication, and so on for three or four attacks over a period of several months." In addition there is the absence of mortality, the rheumatic sequelæ, and "the tongue coated with a thick white fur, tip and edges red." Is it possible to apply this description to any other condition than undulant fever? Fleet-Surgeon Home says, "Surely this fever was due to want of ventilation, and not brucella septicæmia." If the negative is omitted, I agree with him. It was the gross overcrowding and bad ventilation of the transport which permitted the direct transmission of *Br. melitensis* from man to man.

I am, Sir, yours faithfully,

SHELDON F. DUDLEY.

Royal Naval College, Greenwich, April 18th, 1931.

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[1] The Times, April 15th.

OUT-PATIENT DEPARTMENTS AT VOLUNTARY HOSPITALS.

To the Editor of THE LANCET.

SIR,—In your leading article of March 14th you begin with the sentence: "The least satisfactory feature about our hospitals is the out-patient departments." The same dissatisfaction is revealed in certain suggestions concerning out-patient departments at voluntary hospitals brought forward by the Council of the British Medical Association in the Supplement to the *British Medical Journal* of Feb. 21st. As is, of course, well known the Council of the Association brought forward last year another scheme which envisaged the extension of the National Health Insurance Act to the dependents of insured persons, and the present suggestions are supplementary to that scheme, which, if adopted, would bring probably seven-eighths of the whole population of this country under the operation of the Insurance Acts.

The out-patient departments of the voluntary hospitals have become something of an eyesore to those who are anxious to consolidate all the public medical services as far as possible in the hands of the practitioners who work the Insurance Acts. Pari passu with this movement, of which the Council of the British Medical Association is the spearhead, there is another movement which seeks to nationalise the whole medical profession and to transfer entirely to State control all the medical services, including both the panel and the hospitals. The latter movement, which has the whole-hearted support of the Labour party, and which indeed forms one of the planks of their programme as detailed in "Labour and the Nation," has received a very remarkable stimulus from the propositions put forward last year by the Council of the British Medical Association. In a leaflet recently published by those who are promoting a nationalised medical service the proposals of the Council of the British Medical Association as regards extension to dependents are welcomed as a very important advance in the direction of nationalisation. These promoters say, in fact: "We consider that the scheme, with modifications, could be made a forward step towards a free public universal medical service," which is the ideal aimed at by the Labour party. I do not now propose to consider the suggestions of the Council of the Association regarding the inclusion of dependents, but to deal more particularly with their latest proposals regarding out-patient departments at voluntary hospitals.

The British Medical Association, which by its constitution and traditional policy is mainly concerned with the defence of the interests of the panel practitioner, is disturbed by the growth of out-patient departments, and these suggestions are made to counteract that growth, which indeed shows a progressive and, perhaps, unexpected increase. One would have thought that the establishment of national health insurance, with its compulsory contributory clauses, bringing very large numbers of the working population under its operation, would have depleted the out-patient departments at the voluntary hospitals, and this expected result actually occurred in the years immediately succeeding the passage of the Act; from 1911 to 1920 the numbers of out-patients materially diminished. Statistics demonstrate that from 1920 onwards the figures of out-patient departments have risen each year until now they exceed the figure for the year 1911, when the Insurance Act first made its appearance. In the latest report available, published in 1929, in 661 hospitals in England and Wales, excluding London, the number of out-patients is given as 2,589,312, as against 2,136,770 for 657 hospitals in the same area in 1921. A similar growth is recorded for the London hospitals; in 1921 there were 1,451,533 new patients at the out-patient departments, as against 1,760,807 in 1929. The reasons for this growth are difficult to assess and are probably very complex and diverse. I do not think it can be gainsaid that the control by the State of insurance practitioners has steadily increased with the years since the Act came into operation in 1912. With the extension of State control the service of the Acts has undergone some modification, and there is an increasing interference with the liberty of the practitioner by Government departments. Partly, perhaps, as a result of that interference there are widespread indications that insured persons themselves are increasingly dissatisfied with some of the circumstances of national health insurance and I submit that this change of feeling would go far to explain the increased popularity of the out-patient departments at the voluntary hospitals; those who are in charge of departments at the hospitals must have been impressed by the frequency with which patients coming to out-patients declare that they come because they are dissatisfied with the service which they have received under the panel.

With the present system of contributions by out-patients the visit means a direct expenditure by the patient that in itself argües a certain discontent with the panel service for which he has to make a contribution, but which he does not use. The English race is probably the most individualistic in the world, and those who imagine that they can force English men and women to accept a medical service which they dislike are singularly oblivious of the national character. One can take a horse to the water but one cannot make him drink.

Let us now examine the suggestions which the Council of the British Medical Association puts forward to divert the hospital out-patient from the hospital to the panel practitioner. In the memorandum just issued the thesis is laid down that the primary object of the out-patients department should be for consultation, and the following clauses contain the gist of the proposals:—

> "That while there should be adequate opportunities for consultation purposes between the private practitioner and members of the visiting medical staffs at out-patient departments, practitioners should not countenance the use of that department by their patients, except in the ways laid down in this memorandum.
>
> "That no person, except in cases of emergency, should be accepted for treatment as an out-patient at a voluntary hospital unless he brings a recommendation from a private medical practitioner, a provident or other dispensary, a public clinic, or from a public assistance medical officer of a local authority."

As a corollary of these propositions it would seem to be required that every new patient coming to a hospital without bringing a letter should be referred back to his own doctor, and that treatment should only be given when the sanction of the doctor has been obtained. Hospitals are not to receive patients unless "countenanced" by the panel practitioner, acting under the orders of the Council of the British Medical Association. The large and increasing class of patients who are dissatisfied with the conditions of panel practice and would not ask for letters from their doctors would thus be refused both consultation and treatment, and inasmuch as the opportunity which the out-patient departments afford to persons who think they have been inadequately treated, and who may in fact have been inadequately treated, would thus be abolished, to the great detriment, I submit, of the insured population, hospitals enforcing these regulations would be in immediate conflict with a large body of public opinion. Even if the medical profession wished thus to convert itself into a trades-union, which I question, would it be strong enough to force such a position on the community, and would not such a step be the surest way of playing into the hands of those who so ardently desire the nationalisation of all the medical services?

I believe (and I am sure that my belief is shared by many) that if it had not been for the resources provided by the voluntary hospitals the national health insurance service would have long since foundered, and it seems to me to be singularly short-sighted for those who desire the retention and even extension of that service to take the action which they are now proposing in the direction of restraining by artificial regulations the resort by panel patients to hospitals.

I do not think that members of hospital staffs have given any serious thought to these matters, and I think it is high time that they should do so. At this crisis when the voluntary hospitals are being subjected to a competition from State-aided institutions enjoying, for the moment at any rate, the hectic prosperity engendered by an unprecedented squander-mania that seem to have infected all local public authorities, the abrogation of unrestricted access to these hospitals, which the community shows an increasing desire to obtain, seems to me to be a disastrous step to take, and one entirely opposed to the best traditions of the voluntary hospitals themselves. The strength, and it is a very enormous asset, of the voluntary hospital system lies in the fact that voluntary service consorts with the temperament and tradition of the English race. Its weakness, and it is a deplorable weakness, is that action is too often isolated when it should be concerted. Unfortunately there is no efficient official organisation to ensure such concerted action. There is, however, one body to which, in my submission, the *London* voluntary hospitals, at any rate, could make a common application for advice and guidance, a body which enjoys an increasing prestige with the subscribing public and with the hospitals themselves—namely, King Edward's Hospital Fund—which has been able to secure the wise simplification and uniformity in presentation of hospital accounts which now prevails; before accepting any departure of policy so radical as the imposition upon the voluntary hospitals of a purely consultative service as desired by the Council of the British Medical Association, I venture to suggest that the hospitals should consider the whole problem jointly with each other and in consultation with the authorities of that Fund. I am, Sir, yours faithfully,

E. GRAHAM-LITTLE.

House of Commons, April 21st, 1931.

SYPHILIS AND YAWS.

To the Editor of THE LANCET.

> Truth crushed to earth shall rise again:
> Th' eternal years of God are hers;
> But Error, wounded, writhes in pain,
> And dies among his worshippers.
> (*Bryant.*—The Battle Field, St. 9.)

SIR,—The first two lines of the above stanza are doubtless true. William Cullen Bryant was wrong, however, in the two last lines of this verse because error crushed to earth will do the same thing as the poet found truth would do: it will rise again. Some medical errors seem not to do much "writhing" among their worshippers either. Many are hoary with age and yet physicians are perpetuating them to-day in both popular and professional literature. In other words, physicians are the chief worshippers of these errors.

The Ancient European ancestry of syphilis may be shown in a dozen ways, direct and indirect, and yet we find in current literature physicians subscribing to the moth-eaten fallacy that syphilis is of New World origin. So, too, with the yaws fallacy. Since the time of Sydenham and long before him, there have been English and Continental physicians who "thought and taught" correctly about framboesia. Berkeley Hill of English and E. Lancereaux of French physicians, both of the third quarter of the nineteenth century, have shown how completely the yaws syndrome is identified with syphilis. The researches of these older writers have been backed up by clinical, epidemiological, and laboratory researches without number. On the other hand, research workers during the past forty years trying to prove the theory of duality of viruses have failed, so that to-day it is possible to say that yaws is purely an artefact erected over the disease syphilis. This statement is made with the hope that some dualist will produce evidence to the contrary. There has been ample time for all such evidence to assert itself.

The yaws fallacy has persisted in medical literature for two hundred years almost and is so far advanced that practically all English, Continental, and American text-books on tropical medicine give it extensive description. This is due largely to the "library case" made out for yaws and to the repetition from volume to volume and edition to edition of the ever-growing fallacy, thus completing the vicious circle between teacher to student. Recalling the fate of Socrates in similar case, we may well feel that some fallacies of the "Guild of Æsculapius" are virtually immortal and that truth when crushed to earth often takes centuries "to rise again."

I am, Sir, yours faithfully,

C. S. BUTLER,
Captain (M.C.), U.S. Navy.

Washington, D.C., April 8th, 1931.

THE ST. LUKE'S HOSPITAL, HEBRON.

To the Editor of THE LANCET.

SIR,—Is there any medical man among your readers, or known to any of your readers, who would consider an invitation to take charge of St. Luke's Hospital, Hebron, in Palestine? This is a mission hospital, which is financed by the Jerusalem and the East Mission, and is the only hospital in this large Moslem town of 16,000 people. There is no other hospital within 20 miles, and there are many villages in the district which have no other place to turn to for treatment. The experience of the last 18 months has shown that in fact village patients come in considerable numbers from a very wide area, sometimes walking two or three days to reach the hospital.

Medical missionary work has been carried on in Hebron for 38 years, before the war by the United Free Church of Scotland, and since the war by the Church of England. The actual hospital building is new and has been brought up to date, with its own electric light plant, &c., during the last few months at an expenditure of some £3500. There is an English sister as matron and a competent native doctor and staff. The whole usefulness of the hospital is at present seriously limited by the lack of an English doctor. From the professional point of view the work would be most interesting, and it is essential that whoever offers should be a surgeon. There is no other missionary work at present possible in the town or neighbourhood, so that the opportunities before the hospital cannot be exaggerated. There is a chapel in the hospital building, and the grounds are large enough to permit of building a house for the doctor if suitable rented accommodation is not found. From the date that it was reopened, in September, 1929, just after the serious riots, the work of the hospital has received a great welcome from the people of the town, while relations with British government officials have been most cordial.

If any of your readers desire further particulars would they communicate with my Commissary, the Rev. E. M. Bickersteth, Secretary of the Jerusalem and the East Mission, 12 Warwick-square, London, S.W.

I am, Sir, yours faithfully,

RENNIE MACINNES,

St. George's Close, Jerusalem, April 11th, 1931. Bishop.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

MINISTRY OF HEALTH VOTE.

CRITICISM OF GOVERNMENT'S RECORD.

ON April 14th the House of Commons discussed in Committee of Supply a vote of £13,116,212 for the salaries and expenses of the Ministry of Health.

The speech of Mr. GREENWOOD (Minister of Health) in introducing the vote was reported in THE LANCET last week.

SICKNESS AND DISABLEMENT BENEFIT.

Sir KINGSLEY WOOD said he was glad to hear what the Minister had said about National Health Insurance claims, because they were giving considerable anxiety to many of the approved societies. He observed that only a week or two ago the Controller of National Health Insurance, when addressing an important insurance conference, stated it was still necessary for certain societies to strengthen the safeguards adopted by them in connexion with the supervision of claims. He (Sir K. Wood) was glad to know that within the last few months the Minister of Health, without being accused of treating unfairly and improperly the insured classes of the country, had altered, for instance, the regulation affecting change of doctor by insured persons, and that in other ways he was endeavouring to tighten up administration. With regard to the Local Government Act, they were told in 1928 by Mr. Greenwood that that Act perpetuated the evils of the poor-law system, made no provision for the prevention of destitution, and was calculated to increase the high mortality rates among mothers. Only a fortnight ago, however, the right hon. gentleman was saying how smoothly the enormously complicated transfer of functions under the Act had been carried through. He had also said that the transfer merited high praise for all those concerned in it. With regard to the question of housing, Sir K. Wood said that after two years of a Socialist Government more than 200,000 building operatives were walking the streets unemployed; a large number of people had failed to obtain the housing accommodation which they were promised; the output in municipal building had been reduced, and but for the contribution of the private capitalistic builder, there would not have been built even sufficient houses to meet the ordinary growth of the population, and to replace wastage.

MATERNAL MORTALITY.

Viscountess ASTOR said there was a way out of the slum problem, and that was the provision of open-air nursery schools. The Minister of Health had said he was pleased with the health of the country, but in 1929 88,524 children died under the age of 15; and of these 74,497 were under the age of 5. Infant mortality had gone down, and the great loss of life really occurred between the ages of 2 and 5. The House might have expected that the Minister of Health would have some plan for dealing with the situation. She hoped the Government would face up to the problem before it was too late. The Minister of Health was pledged up to the hilt to deal nationally with the question of maternal mortality, but he had not said one word about it in his speech. That was disappointing and disheartening.

HEALTH INSURANCE.

Dr. MORRIS-JONES said he was very disappointed with Mr. Greenwood's speech. The Ministry of Health touched intimately the lives of the people. He had hoped that the right hon. gentleman would have made some reference to future legislation dealing with national health insurance. He was very pleased to hear that the cost of sickness and disablement benefit was reduced last year by £2,000,000. That was a testimony to the very efficient public health services of the country, which were the best in the world. National epidemics of diseases, such as influenza, had been proved to be capable of prevention to a very large extent. He was pleased to find in the report of Sir George Newman for last year that influenza was much less both in extent and virulence than in the preceding year. A great advance had been made in the treatment of this very serious type of illness, the consequences of which were immeasurable in their effect on the physique of the population. He was disappointed that Mr. Greenwood had not promised that the report of the Inter Departmental Committee on the alleged excessive claims for national health insurance sickness benefit would be published. They wanted to know the real causes of these excessive claims. If the report had been published the House would probably have been able to appreciate more clearly the recent departmental Order issued by the Minister of Health in regard to change of doctor by insured persons. That Order, which greatly curtailed the opportunities of the insured population to change their medical attendants, was issued contrary to the wishes of those who spoke for the medical profession. Their point of view was that it was not altogether in the interests of the insured person, and it was not in the interests of the efficiency of medical treatment to curb or limit drastically the opportunity of a patient to change his doctor.

POST-GRADUATE MEDICAL SCHEME.

The House had been much interested by the remarks of Mr. Greenwood with regard to the post-graduate medical school which was initiated by his predecessor, and had been followed up by the present Government. The advances in medical science in recent years had been tremendous, so much so that those medical men who had received their training 20 or 25 years years ago found the greatest difficulty in keeping up with the great and rapid changes in the prevention, diagnosis and treatment of disease. A hard-working general practitioner who worked day and night had very few facilities and inadequate leisure to enable him to study and to keep up to date in medical science. It was often said that specialists were the great people, but in his view the general medical practitioner was the first line of defence against disease. He came into contact day by day with the people, and it was of the greatest importance to the State and its citizens that the general medical practitioner should be up to date in all respects in medical science. General practitioners were often very poor. Medical men hardly ever died rich. He hoped the

Government would see their way to give facilities to general medical practitioners to come to London from time to time to revive and review their knowledge. He was disappointed that the Minister of Health had made no reference in his speech to the Welsh Board of Health, which was doing very fine work. He hoped the right hon. gentleman would give the Board every encouragement. He hoped that if Mr. Greenwood occupied his position this time next year he would be able to give the House a more hopeful, more optimistic, and more successful review of the work which the Ministry of Health had undertaken.

PURE MILK.

Mr. **OSWALD LEWIS** moved to reduce the vote by £100. He said that Lady Astor had referred to the subject of infant mortality. There was no single factor more calculated to affect the death-rate of young children than the purity or otherwise of the milk-supply. In this country the production, distribution, and sale of milk was watched at every stage, and as a result the nation got a very good supply of pure milk. The position in regard to imported milk substitutes, however, was not so satisfactory. The growing quantity of these substitutes which was being imported made this matter one of considerable importance. This country was one of the few countries where no minimum of milk fats was prescribed by law in respect of these milk substitutes. The Minister of Health stated that in his opinion such regulations were not necessary. He had also stated that these milk substitutes were in fact nutritious and did not contain anything likely to render them harmful as an article of diet. He (Mr. Lewis) was not sure that all members of that House were equally satisfied on that score. It was useless to spend money, time, and trouble in ensuring that the milk produced on our own farms reached the consumer in a pure condition if they were to take no precautions in regard to the steadily increasing proportion of the population who used imported milk substitutes of inferior quality.

Mr. **KINLEY** said in some areas it was suggested that applicants for relief were not fairly treated, and there was no medical standard of physical requirement. He appealed to the Minister of Health to consider whether he could not devise through his own medical officers some minimum physical standard to which all poor-law relief must conform.

Lieut.-Colonel **FREMANTLE** said the main problem in regard to milk in its relation to health did not lie in its cleanliness, although that was of importance; the main difficulty was to get the milk free from tubercle. Fifteen months ago he asked the Minister of Health if he would have an authoritative statement prepared by his department giving the main facts and conclusions with regard to bovine tuberculosis. The Minister of Health told him that the memorandum would be published, and the Parliamentary Secretary had later informed him that the memorandum was being printed and would be published at an early date. That was on Feb. 5th, but on April 14th the document had not been published. This was an instance of the dilatoriness in the Ministry of Health at the present time, and he hoped that when they took up a definite idea which had been proved to be helpful, they would push it through a little more quickly than they had done in the past. A new regulation had been made by which insured persons could not change their doctor without giving a quarter's notice. Some of the committees dealing with insurance considered that this was a most retrograde step. The medical practitioners did not ask for this restriction, and it had always been considered to be in the interests of both patient and doctor that there should be freedom of choice of doctor. The medical profession did not think that this change was advisable.

MEDICAL OFFICERS OF HEALTH.

The appointment of medical officers of health, especially of counties and county boroughs, was of great importance nowadays. At present those appointments were subject to inconvenient regulations by the Minister of Health. Hitherto the local authorities had had to make their own appointments separately and independently, and each local authority had its own staff. When a post of a medical officer of health was vacant the local authority advertised the appointment, but the conditions which were now imposed did not attract the best applicants. He wanted the Minister to see if he could not help in this matter. The changes which were necessary did not require any fresh legislation; all that was required was more coöperation with the local authorities concerned. He noticed that the senior appointments were limited to men under 40 years of age. That was one of the difficulties, and it was quite unnecessary to specify such an early age. When medical officers could hold these appointments up to the age of 60 years it seemed very unjust to limit them to applicants under 40 years of age.

Major **ELLIOT** said he could imagine no more important thing for a community to-day than to know whether the bone and the muscle of the people, the fibre of the nation, was becoming rotten or sounder, whether the health of the nation as expressed in tuberculosis statistics and infantile mortality statistics, and statistics for diseases such as cancer and diabetes was improving or not. After the long-continued stress of unemployment it was necessary to know whether it was being reflected in the physical constitution of the nation. Seldom had he heard the estimates of the Ministry of Health treated with such universal condemnation as they had been that day. Public health was not the only question that had been raised. The number of those in receipt of poor-law relief was still well over a million. In regard to housing the Minister of Health had ridden off on promises.

THE MINISTERIAL REPLY.

Miss **LAWRENCE** (Parliamentary Secretary to the Ministry of Health), replying to the debate, said although the figures of 1930 were not yet to hand, every indication pointed to the fact that 1930 was an exceptionally healthy year. Infant mortality had sunk to the lowest point ever known, and was now at the figure of 60. The claims on the approved societies showed a considerable rise for the first quarter of 1929, which was marked by the influenza epidemic. The claims were in round figures 15½ in 1928, 17¾ in 1929—due mainly to the influenza epidemic—and they were down now to rather over 15½. Cancer, unfortunately, was an exception to the general rule. They had been told that doctors objected to changes in the regulations which extended the period during which a patient might not change his doctor. As a matter of fact a doctor, if he chose, could let his patients go at any minute he liked. The medical profession had discretion in the matter. She hoped that the report on bovine tuberculosis would be published in a few days. The housing programmes of local authorities showed the immense increase of no less than 80 per cent. over the actual building last year carried out by those authorities. They were responsible last year for about 37,000 houses. Their programmes provided for an average of 67,000 houses a year for the next five years. In other words, the annual average would be considerably greater than the total attained during all the years since 1919.

The motion to reduce the vote was negatived by 199 votes to 72.

TOWN AND COUNTRY PLANNING BILL.

Mr. **GREENWOOD** (Minister of Health) in moving, on Wednesday, April 15th, the second reading of the Town and Country Planning Bill, said that the planning of built-up areas was a necessary corollary of any legislation designed to make a definite attack on the slums and arrange for the demolition of slum property. It was of vital importance that the areas which were cleared of slum property should be developed on sound, sane, and economical lines, and in the rehousing of slum dwellers it was important that the local authorities should act on a definite plan. He regarded planning as an important economic problem and as a means of national economy. The first clause of the Bill dealt with the extension of planning powers. It was made quite clear that planning should now be extended to built areas. It also extended the need for planning to rural areas. It was provided in Clause 3 that regional committees should make their regional schemes to be filled in afterwards by local authorities in Clause 9, with supplementary schemes. It was further laid down in Clause 13 that the details of a scheme could be approved by supplementary orders. Compensation would be excluded in the case of the prohibition of the use of land for a purpose likely to involve danger to the health of the neighbourhood or be seriously detrimental to it—such purposes, for example, as refuse dumps and so forth. As the law stood at present the local authority might claim one-half of the betterment which accrued from a town-planning scheme. He saw no reason why the local authority should not, under this scheme, claim 100 per cent. of the betterment, and that was so provided in Clause 19. The provision in the Bill in regard to garden cities and satellite towns was in principle that contained in existing legislation. If new garden cities were to be established and developed successfully they should be planned properly from the outset. He hoped that it might be possible to discuss the principles of the Bill in Committee with a considerable measure of agreement.

BETTER LATE THAN NEVER.

Mr. CHAMBERLAIN said that Mr. Greenwood had worked in the wrong order. The right hon. gentleman told the House that a planning Bill of this kind was a necessary corollary to plans for slum clearance or the rehousing of slum populations. He (Mr. Chamberlain) said that it was a necessary precedent to it, not a corollary. He was sorry that the right hon. gentleman did not bring in this Bill first and the Act of 1930 afterwards. However, it was perhaps not too late in this Bill to draw the attention of local authorities to the fact that in any housing operations that they might carry out as a consequence of slum clearance they must pay attention not merely to bricks and mortar but also to the questions of transport and of the proper commercial use of the sites at their disposal. Speaking generally of the measure Mr. Chamberlain said that he regretted that there had not been more productive and fruitful thinking on a subject which he believed to be of great importance to the housing of the people in the future and of the proper development of the country and the town.

After further debate the Bill was read a second time without a division. The money resolution in connexion with the Bill was afterwards agreed to in Committee.

HOUSE OF COMMONS.

THURSDAY, APRIL 16TH.

Change of Panel Doctor.

Mr. ALBERY asked the Minister of Health if he would consider amending the new regulation which restricted the right of insured persons to change their medical adviser.—Mr. GREENWOOD replied: The answer is in the negative.

Tuberculosis in South Shields.

Mr. EDE asked the Minister of Health if his officer who recently investigated the prevalence of tuberculosis in South Shields made any report on the incidence of this disease in those parts of the borough where the partition of houses into tenements had taken place; whether the officer made any report on the rents demanded for such tenements; and whether he had taken any action on the report.—Mr. GREENWOOD replied: The answer to the first and second parts of the question is in the negative. As regards the last part, I have at the request of the town council invited a number of local authorities in the north-east of England to send representatives to a conference for the purpose of considering the question of institutional accommodation for the treatment of tuberculosis in that area, and it is hoped to arrange for the conference to be held at an early date.

Opticians and Health Insurance.

Mr. GRAHAM WHITE asked the Minister of Health the total number of approved opticians, distinguishing between qualified and unqualified persons, under the national health insurance scheme.—Mr. GREENWOOD replied: I have no information as to the number of opticians who undertake the supply of optical appliances to insured persons entitled to ophthalmic benefit under the National Health Insurance Scheme. The regulations governing the administration of this benefit do not provide for the approval of opticians.

MONDAY, APRIL 20TH.

Medical Authorities and Commutation Applications.

Sir HERBERT CAYZER asked the Minister of Pensions whether he was aware that hardship was being caused to retired regular officers whose applications for commutation had been refused on medical grounds; and if he would consider placing such cases before the medical authorities' commutation board for a ruling decision, especially where officers were also in receipt of service retired pay and wounds pensions in addition to disability pension.—Mr. F. O. ROBERTS replied: Under the Pensions Commutation Acts and Regulations the Minister of Pensions is required to determine whether any application for commutation should be recommended to the Pensions Commutation Board for consideration, and regard is necessarily had to the officer's state of health and expectation of life. Where any medical advisers consider that the case is unsuitable on these grounds it is not possible for me to recommend it.

Unfit Houses in Walsall.

Mr. MCSHANE asked the Minister of Health in respect of the county borough of Walsall the number of houses certified as unfit for human habitation; and the number of houses proposed to be built under the Slum Clearance Act, 1930, during the next five years.—Miss LAWRENCE (Parliamentary Secretary to the Ministry of Health) replied: My right hon. friend is informed that 274 houses in the county borough of Walsall have been represented by the medical officer of health as being unfit for human habitation. The council propose to build 1000 houses under the Housing Act, 1930, during the next five years in addition to 300 houses under the Housing Act, 1924.

Cattle and Intradermal Test.

Brigadier-General CLIFTON BROWN asked the Minister of Health whether his attention had been drawn to the uncertainties of the intradermal test on cattle for tuberculosis; and if, in view of its unreliability, he would take steps to standardise the tuberculin on the market so that all tests could be carried out with the same serum.—Miss LAWRENCE replied: My right hon. friend is advised that the intradermal test is the best form of the tuberculin test under ordinary farm conditions, but that the results obtained cannot be relied on unless tuberculin of sufficient potency is used. My right hon. friend is considering the question of the standardisation of tuberculin in consultation with my right hon. friend, the Minister of Agriculture and Fisheries.

Government and Hospital Sweepstakes.

Sir WILLIAM DAVISON asked the Home Secretary whether in view of the information recently supplied to him and also of the losses which were being suffered by British hospitals by the falling off of subscriptions since the recent Irish Free State sweepstakes in aid of Dublin hospitals, he was now prepared to set up a committee to investigate the conditions and safeguards which would be necessary if lotteries were to be permitted as a method of raising money for approved public purposes.—Mr. CLYNES replied: I have delayed coming to a decision on this question in the hope that I might receive some definite indication of the attitude of those responsible for the more important charities. Such indication as I have received seems on the whole adverse. I think it will be wise to defer a decision for some time longer, particularly as there can, of course, be no question of legislation this session.

Insured Persons and Dental Benefit.

Mr. R. J. RUSSELL asked the Minister of Health the number of insured persons eligible to receive dental benefit under the scheme of additional benefits; the number of insured persons who actually received such benefit during the last year for which figures were available; the cost to the approved societies of the benefit in that year; and the total cost of the treatment given, inclusive of that part of the cost paid by the insured persons themselves.—Mr. GREENWOOD replied: The number of insured persons in England and Wales who were eligible in 1930 to receive dental benefit is estimated at approximately 10,500,000. Of these the number who actually received the benefit is believed to be rather over 1,000,000. The cost of the benefit to approved societies in 1930 was, roughly, £2,100,000. As precise information is not available as to the amount paid by insured persons themselves, it is not possible to state the total cost of the treatment given.

TUESDAY, APRIL 21ST.

Blind Persons Act Administration.

Sir NICHOLAS GRATTAN-DOYLE asked the Minister of Health the cost of administering the Blind Persons Act, 1920, in England and Wales; the total number of registered blind persons in England and Wales on March 31st, 1931; the total number of blind persons between the ages of 50 and 70 years, and the number who were in receipt of blind old-age pensions, stating the reason why the remainder were not being granted pensions; the total number of blind old-age pensioners over 70 years of age; the number of blind persons in England and Wales under the various age-groups: 0–5 years, 5–16 years, 16–21 years, 21–30 years, 30–40 years, and 40–50 years; the total cost of pensions paid to persons under the Blind Persons Act, 1920; and the number of blind persons in receipt of poor-law relief and the average amount paid.—Mr. GREENWOOD replied: No complete figures are available of the total cost of administering the Blind Persons Act, 1920. The total number of registered blind persons in England and Wales was 52,727 on March 31st, 1920, the latest date for which official figures are at present available. According to unofficial figures obtained from the Counties' Associations for the Blind there were 56,853 registered blind persons on March 31st, 1930. Of that number 22,002 were between the ages of 50 and 70, and 10,018 were in receipt of blind old-age pensions. The estimated number in receipt of such pensions on March 31st, 1931, was 20,300. The remainder were not in receipt of pensions, either because they had not applied for a pension or because they did not comply with the statutory conditions for a pension. The number of blind old-age pensioners over the age of 70 is not known, because after attaining that age blind pensioners rank as ordinary old-age pensioners, "blindness" ceasing to be a statutory condition for a pension. The following Table gives the number of blind persons in England and Wales on March 31st, 1930, under the age-groups mentioned, according to the unofficial figures referred to above:—

Ages.	Number.	Ages.	Number.
0–5	267	16–21	1,637
5–16	2,401	21–50	14,354

Separate figures are not available for the age-groups 21–30, 31–40, and 41–50. The total cost of pensions paid to persons in England and Wales under the Blind Persons Act, 1920, for the year ended March 31st, 1931, was £512,000, and the estimated cost of administration for that year was £12,500. The information asked for in the last part of the question is not available.

Spotted Fever at Aldershot and Catterick Camps.

Mr. D. G. SOMERVILLE asked the Secretary for War if the military camp at Aldershot was now completely free from spotted fever; if cases were reported from Catterick camp; and whether there was any similar epidemic in other camps in England.—Mr. T. SHAW replied: During the present month there have been two fresh admissions to hospital at Aldershot in respect of cerebro-spinal fever. As regards Catterick, there have been four admissions during the present year. At no military centre other than Aldershot and Catterick have there been more than three cases during the present year, and there has been no epidemic at any military centre, sporadic cases only having occurred. The hon. Member does not, I hope, think that this is a disease occurring only among troops; it has, unfortunately, occurred also among the civil population.

Dunfermline College of Hygiene.

Mr. WATSON asked the Secretary for Scotland whether a decision had yet been arrived at respecting the proposed transfer of students from the Dunfermline College of Hygiene and Physical Education; and whether, in view of the opposition the suggestion had aroused and the trouble and expense the establishment of the college had caused to the Carnegie Dunfermline Trust, he could see his way to continue the work of the college as at present.—Mr. ADAMSON replied: It has been decided that as from October next the men students shall receive their training at the Glasgow Training Centre, where the necessary provision is being made. As regards the women students, I understand that the question whether they should ultimately receive their training at Dunfermline or elsewhere is likely to be considered at an early date by the National Committee for the Training of Teachers in conference with the Carnegie Dunfermline trustees, who act as managers of the college. In the meanwhile steps are being taken for the appointment of a woman principal to supervise the training of the women students at Dunfermline.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

THE following appts. have been notified:—Surg. Lts. V. G. Horan to R.N. Hospital, Plymouth, and R. C. Foster to *Bryony*.

ROYAL NAVAL VOLUNTEER RESERVE.

Proby. Surg. Sub-Lts. J. F. M. Milner and S. O. Suggitt to be Surg. Sub-Lts.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. W. G. Maydon retires on retd. pay.

Maj. (temp. Lt.-Col.) J. E. M. Boyd to be Lt.-Col., vice Lt.-Col. W. G. Maydon.

Maj. M. O. Wilson to be temp. Lt.-Col.

F. V. Cant is granted a temp. commn. in the rank of Capt.

TERRITORIAL ARMY.

Capt. A. W. Wakefield having attained the age-limit retires, and retains his rank, with permission to wear the prescribed uniform.

Capt. C. B. Macleod from 13th Highland Light Bde., R.A., T.A., to be Capt.

Lt. R. Anderton to be Capt.

M. C. Hounsfield (late Offr. Cadet Serjt., Cambridge Univ. Contgt., Sen. Div. O.T.C.), and James Morissey (late Offr. Cadet Lce.-Corpl., Liverpool Univ. Contgt., Sen. Div., O.T.C.) to be Lts.

Supernumerary for Service with the O.T.C.—Capt. H. E. A. Boldero resigns his commn.

INDIAN MEDICAL SERVICE.

J. Acheson to be Capt.

Bashi Lal Taneja and Hoc Min Sein to be Lts. (T.C.).

Lt.-Col. D. G. Rai retires.

ROYAL AIR FORCE.

Flight Lt. R. J. I. Bell is transferred to the Reserve, Class D. (ii).

HONORARY APPOINTMENTS TO THE KING.

The King has approved the appointment of Major-General H. Boulton, C.B., C.B.E., I.M.S. (Honorary Surgeon to the Viceroy of India), as Honorary Surgeon to the King; and Colonel C. W. F. Melville, I.M.S., as Honorary Physician to the King.

ORDER OF THE NILE.

The Insignia of Commander of the Order of the Nile has been conferred upon Major Joseph Clinton Collins, R.A.M.C., by the King of Egypt in recognition of valuable services rendered by him.

DEATHS IN THE SERVICES.

Major-General George Francis Angelo Harris, C.S.I., who died on April 16th in London at the age of 75, was the son of the late Major-General C. S. Harris of the Bengal Staff Corps, and received his early education at Bedford Modern College. Later he entered St. George's Hospital, and after qualifying with the L.R.C.P. Lond. and M.R.C.S. Eng., joined the Indian Medical Service in 1878, and saw service in the second Afghan War (medal). In 1893 he obtained the M.R.C.P. Lond., in 1902 the M.D. Durham, and obtained the F.R.C.P. Lond. in the following year. Among the appointments which he held were those of professor of materia medica at the Calcutta Medical College, and physician to the College Hospital, Inspector-General of Civil Hospitals in the Punjab and the United Provinces. He was also employed on medical work in Bengal. In 1911 he received the C.S.I., and three years later was made hon. surgeon to the King and to the Viceroy of India. He married in 1883 Alice, daughter of General A. E. Campbell, of the Bengal Staff Corps, by whom he had two sons and four daughters.

PLYMOUTH HOSPITALS.—An appeal is being made for at least £25,000 beyond the amount already subscribed to cover the cost of the extensions to the South Devon and East Cornwall and Royal Albert Hospitals. These two institutions, the Central Hospital and the Royal Eye Infirmary, together last year treated 5419 in-patients and 16,773 new out-patients, in addition to the work done at the city municipal hospital.

OBITUARY

THEODORE DYKE ACLAND, M.D., F.R.C.P.Lond.,

CONSULTING PHYSICIAN TO ST. THOMAS'S HOSPITAL.

WE regret to record the death of Dr. Theodore Acland, which occurred at his residence 19, Bryanston-square, on Thursday, April 16th, in the eightieth year of his age.

Theodore Dyke Acland was the younger son of Sir Henry Acland, the famous Regius Professor of Medicine at Oxford. He received his school education at Winchester, whence he proceeded to Christ Church, Oxford, and completed his academic studies with a first-class in the natural science schools in 1874. Entering at St. Thomas's Hospital, he graduated in medicine in 1880, taking the degree of M.D. in 1883. After filling the usual appointments he attended post-graduate courses at Leipzig and Berlin, and in 1882 was appointed demonstrator of physiology in the St. Thomas's Hospital Medical School. In 1887 he was elected to the assistant staff and from that time his medical career was a very full one and active along several lines.

DR. ACLAND.

[*Photograph by J. Russell & Sons.*

While still working in the medical school he was sent by the Foreign Office to Egypt, for in 1883 a serious epidemic of cholera was causing much anxiety there. He remained in Egypt for some time serving with the Egyptian Army of which he became P.M.O. and where his services were rewarded with the Imperial Order of the Medjidie, while he also received the personal thanks of the Khedive. On returning to England he took up his duties at St. Thomas's Hospital, being also appointed to the Brompton Hospital for Consumption and Diseases of the Chest, and his work in both institutions marked him out as a high clinical authority. His qualities of character assisted him alike in the treatment of his patients and in securing from his house officers the best they could bring to their work. On the appointment of the Royal Commission on Vaccination, which sat for seven years from 1889, Acland was elected a member of the Commission and served throughout its protracted sessions. He brought an analytical mind to bear on the problems, both scientific and social, presented by the vaccination question, and those who have studied that report, and the documents presented to it, no less than the evidence, will recall the need that was required for wisdom and moderation in arriving at the conclusions.

In 1897 King Edward VII.'s Hospital Fund for London was instituted and Acland became a member of the visiting committee, while in 1906, on the foundation of the King Edward VII. Sanatorium he was elected physician to the institution; in both cases his selection for the duty was due to his repute as a fair and learned man, while his wide social connexions were of value to the organisations.

Acland was influential in the affairs of the Royal College of Physicians of London. Elected to the Fellowship in 1889, after the minimum period as a member, he was a member of council for two years, censor for two years (1913–15), and an examiner in medicine at the Conjoint Board. His services as an examiner were also requisitioned by the India Office, and by the Universities of Oxford (where he was also a member of the Board of the Faculty of Medicine), of Cambridge, Manchester, and Leeds. His sympathetic bearing no less than his clear-cut knowledge recommended him to the delicate task of sound examining, and in 1906 he renewed in this way his acquaintance with Egypt by becoming the first assessor of examinations to the Cairo Medical School. He was also elected a member of the Egypt and Sudan London Medical Board and medical officer to the Sudan Government. For these services he received, in addition to the Order of the Medjidie, the Imperial Osmanieh Order and the Order of the Nile.

During the war Acland's work was enthusiastically performed. Appointed a Lieut.-Col. R.A.M.C. (T.) his counsel was called upon in many directions both during and after hostilities. He was a consultant physician to the Ministry of Pensions, and to the National Council of the Y.M.C.A. in t efforts to meet the cases of the discharged and disabled soldiers, while he was also concerned in the provision of housing for disabled service men—the Seal Foundation. He put his energy and heart into all these schemes for the relief and betterment of the victims of war, and many will be mourning in him the loss of a friend.

Acland was not a frequent writer or a controversialist, though he made a considerable number of useful communications upon many subjects allied to medicine. To Allbutt and Rolleston's System he contributed the articles on vaccinia, actinomycosis, and subphrenic and other forms of peritoneal abscess; he edited the works of Sir William Gull, and for several years the St. Thomas's Hospital Reports.

The following tribute from Dr. V. S. Hodson, once Dr. Acland's house physician, gives a sympathetic picture of him: "From the day, now nearly 30 years ago, when I took up duty as Dr. Acland's house physician, friendship began between us, and as the years passed it grew and strengthened and, without setback or cloud, has been one of my most treasured possessions, and is now a hallowed memory. It would be difficult for me to say how much I owe him, whether as a teacher or friend, or as an example to be followed. From those far off days of hospital association I learnt many things from him, and I have never worked for anyone more appreciative or stimulating. His gentleness, courtesy, and sympathy in dealing with his patients were a permanent lesson, and his happy way of getting the best out of his subordinates by just expecting it and by relying on them to produce it was as successful as it was pleasant. I once heard one of his colleagues say that all Dr. Acland's geese were swans. I believe this to be more or less true and to mean, in reality, hat he always thought the best possible of those who worked for him, with the result that the geese did their outmost to prove him right, and not disappoint his trust. No trouble was too great for him to take on behalf of a junior, for him his large and weighty influence was freely used. His charities were innumerable and almost wholly anonymous."

Dr. Acland married Caroline Cameron, the only daughter of the great physician Sir William Gull; she died in 1929, and one son survives, Captain Theodore Gull Acland.

JAMES LORRAIN SMITH, M.D. Edin., F.R.S.

Prof. J. Lorrain Smith died on April 18th. He had been ill for some months and had been relieved of his duty as Dean of the Medical Faculty.

PROF. LORRAIN SMITH.

Block lent by the "Scotsman."

Lorrain Smith was a graduate in arts of Edinburgh University and achieved distinction in philosophy. In 1885 he won the Ferguson scholarship in philosophy which, at that date, was the blue riband among competitive prizes open to graduates of the four Scottish universities. He had a very distinct philosophical bias and, had he kept to this line, he could have achieved a distinction as great as he ultimately did in medicine. But in 1885 he entered medicine at Edinburgh and took his M.B., C.M. in 1889 and his M.D. in 1893. After graduation, he studied for a period with Prof. Burdon Sanderson at Oxford, himself one of the rare philosophic minds in the physiology of that day. Afterwards, he worked under Prof. C. S. Roy at Cambridge, where he held the John Lucas Walker scholarship in pathology. He spent some time at Strassburg and Copenhagen. His earlier work was mainly in physiological research; but, while maintaining a strong interest in physiology, he took to pathology and the problem of all his teaching days was how to exhibit the physiological groundwork of pathology. He had acted at Cambridge as demonstrator in pathology, and later became first lecturer and then professor of pathology at Queen's College, Belfast. From Belfast he was appointed in 1904 professor of pathology in the University of Manchester and honorary pathologist to the Manchester Royal Infirmary. Eight years later he was appointed to the chair of pathology in Edinburgh University. While still in Manchester, he was a member of the General Medical Council and, later, he represented Edinburgh University on the Council.

Lorrain Smith had been a prominent and popular figure in British pathology for the last 30 years, in an important period of transition and development, and his loss will be deeply felt by his fellow-workers on personal no less than scientific grounds.

In his laboratory work he was at first closely associated with Prof. J. S. Haldane; they investigated the alleged mysterious poison in expired air, and the results were published in the first volume of the *Journal of Pathology and Bacteriology* when it was founded by the late Sir German Sims Woodhead and Mr. Pentland in 1892. He worked, too, at hæmoglobin in its various aspects, carbon monoxide poisoning, the secretion of oxygen by the lungs, and devised the first satisfactory method of determining the blood volume in man. From this last emerged his most fundamental discovery, worked out in Belfast—that the anæmia of chlorosis is due to the dilution of the blood with an excess of plasma, while in pernicious anæmia there is a real deficiency of hæmoglobin (*Trans. Path. Soc. Lond.*, 1900, li., 311). He showed the actual existence of a persistent state of anæmic plethora which Cohnheim and others had tried in vain to produce experimentally, and thus threw an entirely new light on the pathology of the disease. The new questions which his discovery raised have not been solved, and now that chlorosis has practically disappeared probably never will be. By this time Lorrain Smith was a professor of pathology. His further work lost the "physiological" tone which was so welcome, and ran along more conventional lines. The second investigation for which he will be remembered was pursued chiefly in Manchester, and mainly in collaboration with Dr. W. Mair and to a less extent with the late Dr. C. Powell White. It dealt with the nature and especially the microscopical identification of lipoids, and out of it came two well-known histological methods—the staining of fresh fat with nile blue sulphate which distinguishes neutral fats from fatty acids, and the extension of Weigert's bichromate-hæmatoxylin process for myelin to the examination of tissue lipoids. In this work he secured the useful collaboration of his chemical colleagues in the University of Manchester. Without counting a number of minor researches, Lorrain Smith has certainly left his mark on technical pathology.

But he will be remembered by the younger generation, perhaps particularly, as a sane, idealistic, and always friendly guide and leader—rather dreamy and vague sometimes in university affairs, by nature fond of the traditional methods of diplomacy, but always steadfast in his belief in sound learning and the pursuit of knowledge; no student or graduate can have ever got the idea from him that university education was not worth while. He had a singular faculty for encouragement. He fortunately had rather exceptional opportunities for developing his ideals. He went to Manchester to take over the pathological laboratory when the chair was divided and Delépine restricted himself to bacteriology, and in Edinburgh, in succession to Greenfield, he was the first professor of pathology without clinical beds to distract his attention. He also had much to do with the founding of the Pathological Society of Great Britain and Ireland in 1906 and the Pathological and Bacteriological Laboratory Assistants' Association in 1912—two organisations which have effected something like a revolution in British pathology.

All Lorrain Smith's research showed the philosophic grasp of his mind. He was never lost in detail. He had always before him the fundamentals of biology; indeed, it would not be too much to say that his primary interest in life was the philosophical interpretation of biological phenomena. In his work, as dean of the medical faculty at Edinburgh, he devoted himself to the task of correlating the teaching of biology with the teaching of anatomy, pathology, bacteriology, and practical medicine. He saw the same fundamental principles in them all and, in the end, persuaded several of his colleagues to try the experiment of parallel teaching of the various subjects from the different standpoints. This, of course, was not entirely possible under university conditions, but in some of the classes the system was established and the results were good. In his own teaching he put the greatest stress on securing for his students direct contact with the actualities. He would give them a problem in some morbid condition, placing before them the history of the case, the system of treatment, the morbid products from the post-mortem table, and require them to correlate all these into a coherent account of the problem as a whole. This kind of teaching was slow from the examination standpoint; but his students informed him again and again that the most fascinating part of their curriculum had been this "research method" of learning pathology. On one occasion a distinguished American medical man put to him the question how it was that the professors in the Scottish universities not only did research work but also taught, while in America research and teaching were looked on as two distinct lines. Lorrain Smith's reply was that in his own experience he found that constant work in research enabled him to enrich his teaching in a way otherwise impossible, and that he continued his research in order that he might teach better. He maintained that research kept the professor alive in his teaching and the teaching continually stimulated him to further research. This was certainly so in his own case and it is a principle not to be lost sight of. It is true that many of the Scottish schools and some of the best research in several departments have emerged from men who were also well occupied in the teaching of large classes.

A colleague writes: "In the journeys from London to Edinburgh, following the six monthly meetings of the Medical Council, Lorrain Smith and his friends usually discussed biology, its place in the curriculum, how this school, how that school were advancing along special lines, and how far it was possible to have the whole curriculum based on a thoroughly taught and thoroughly understood study of biological ideas. And biology he always used in the larger sense as including physiology. He was thoroughly against the bulkhead idea of separate subjects and he wished to see the whole curriculum developed as a system of biological ideas applied in the practice of medicine. A favourite maxim was 'Get to the ætiology and then your treatment will follow as a deduction.' Of the friends that knew him in his early philosophical days, this type of reasoning was very familiar and it was a joy to talk with him on those subjects.

"He was not a mere dreamer, although his mind never rested from the study of metaphysics and the larger principles of science. He was also a man of action. As dean of the faculty, he took particular pains to direct the individual life, and many a man owes his good grasp of medicine to Lorrain Smith's direction.

"Among his minor pieces of work was the experimental invention of eusol. The primary idea of this well-known antiseptic was to secure a powder that could be immediately sprinkled on a wound where the moisture would be enough to set free some antiseptic material. The active principles of eusol are chlorine and boracic acid. Later, the powder was supplemented by the solution and, with due attention to freshness, this solution has given excellent results. The name, it is understood, is simply the initials of Edinburgh University, linked to the syllable 'sol.'

"Lorrain Smith was a humanist in the widest sense. At Edinburgh he took his part in constructing the University Settlement and the School of Social Study, and he lent himself in various ways to the promotion of social movements. He also took a leading place in the movement for the reading of verse. His knowledge of ballad literature was extensive and his sensitiveness to literary form of every kind was exceptional. In culture and accomplishments he belonged rather to the old school that included Duncan, Abercromby, and John Brown. He thought of life in its greater relations. Among philosophers he counted as a technical philosopher; among scientific men he had proved his quality as an investigator, and, on the practical side, he showed a profound knowledge of sound teaching method and constructive administration."

Prof. Lorrain Smith was a son of the late Rev. Walter Smith, Half Morton, Dumfriesshire. He leaves a widow, one son, and four daughters.

MEDICINE AND THE LAW.

Negligence Action against Surgeon.

IMPORTANT observations as to the duties of a surgeon were made by Lord Justice Scrutton on April 20th in dismissing a surgeon's appeal against an adverse verdict of negligence. At Shrewsbury Assizes a special jury found that the surgeon had been negligent in leaving a swab or pack in the patient's body in the course of an operation; as the result the patient died and £1500 damages were awarded to the widow, £500 to a child, and £100 as special damages. The defence was a denial of the negligence and a reliance on the fact that it was the duty of a skilled nurse to count the swabs or packs as they were removed from the patient's body. The Medical Defence Union acted for the surgeon.

Lord Justice Scrutton does not say that the surgeon may not rely upon an assurance by a competent nurse that a tally has been kept of the swabs, that all the swabs have been removed, and that therefore he need himself make no further search. The Lord Justice merely points out that, if the surgeon received no such assurance, he cannot rely upon that defence. "In answer to the question put to them, the jury found that the evidence was to their minds not satisfactory that the doctor had received the necessary assurance." Lord Justice Scrutton appears to assume that, in the absence of such an assurance from a competent person, the surgeon is personally responsible. "It is clear that the only person who put the swabs in and selected the places where they were to be placed was the doctor. He alone knew where he had put them. . . When the operation was completed, it still remained for the doctor to take out the swabs which he had put in." Almost every jury would find that it was careless to leave a swab in the body. The Court of Appeal had only to consider whether the verdict was one at which the jury could reasonably have arrived, or on the other hand whether it was one which the Court could not uphold. In the Lord Justice's opinion the verdict was not one with which the Court could interfere. His colleagues concurred and the appeal was dismissed. It thus appears that, if the Court of Appeal is right, the duty of counting the swabs does not naturally fall on the skilled nurse but remains primarily the duty of the surgeon. The surgeon may rely on a report from the skilled nurse that all swabs have been counted, that the tally is correct, and that, therefore, he need not himself make any further search. But he must, it seems, obtain this assurance and be able to prove definitely that it was given if he is to rely on it as a defence.

MEDICAL NEWS

University of London.

Forthcoming Lectures.—Three lectures on the Pharmacology and Therapeutics of Lead Colloids with particular reference to their use in the treatment of neoplasms will be given at King's College, Strand, at 5.30 P.M., on May 7th, 8th, and 11th by Dr. W. J. Dilling, professor of pharmacology in the University of Liverpool.—Dr. R. J. Lythgoe will give six lectures on Special Sense Physiology, at University College, Gower-street, at 5 P.M., on Thursdays, from May 7th to June 11th inclusive.

University of London Medical Graduates Society.

The annual London dinner of this society will be held on Tuesday, May 12th, at the Langham Hotel, Portland-place, W., at 7 for 7.30 P.M., with Sir John Rose Bradford, the President, in the chair. Medical graduates can obtain tickets from the secretaries of the society at 11, Chandos-street, Cavendish-square, W.1, before May 8th.

St. Marylebone General Dispensary.

The twenty-fifth anniversary of the opening of the infant welfare clinic will be celebrated at this dispensary on Wednesday, April 29th, at 5 P.M. (tea 4.30 P.M.). The speakers will include Miss Susan Lawrence, Parliamentary Secretary to the Ministry of Health, Dr. Eric Pritchard, Dr. Charles Porter, Mr. W. McAdam Eccles, F.R.C.S., and Dr. J. F. Halls Dally.

St. Mary's Hospital Institute of Pathology.

A course on pathological research in its relation to medicine will open at the Institute of Pathology and Therapeutic Research, St. Mary's Hospital, London, W., at 5 P.M., on May 5th, with a lecture by Sir Almroth Wright, F.R.S., principal of the Institute, on the Organisation and Methods of Medical Research. The course will continue at the same hour on Tuesday afternoons until June 23rd, and the lecturers will include Prof. John Mellanby, F.R.S. (Recent Work on Blood Coagulation); Colonel S. P. James, F.R.S. (the New Method of Studying Malaria); Dr. Bernard Hart (the Causation of Neurotic Disorders); and Dr. André Gratia, of Brussels (the Shwartzman Phenomenon). The lectures are open to members of the medical profession and medical students, without fee.

Congress of Military Medicine and Pharmacy.

The Sixth International Congress of Military Medicine and Surgery and Pharmacy meets at The Hague from June 15th to 20th under the presidency of Dr. J. C. Diehl, director-general of the Army Medical Services of the Netherlands. The principal subjects of discussion will be the recruitment and training of medical and pharmaceutical officers, the psychoneuroses of war, the preparation and conservation of medicine in tubes and their use by military medical services, the arrest of hæmorrhage on the battle-field and standards of material for this purpose, and the sequels of wounds of the teeth and lower jaw. A historical exhibition is being organised in connexion with the congress. The secretary-general is Jhr. R. Sandberg van Boelens, and the office is at 3, Surinamestraat, The Hague. Travel arrangements are in the hands of Thos. Cook and Son, Berkeley-street, Piccadilly, London, who will supply particulars of accommodation and facilities for the journey.

Congress of Radiology.

The Third International Congress of Radiology will take place in Paris from July 26th to 31st under the honorary presidency of Madame Curie and the executive presidency of Dr. Antoine Béclère. During the opening meeting Prof. G. Forssell (Sweden) will speak on the Social Struggle against Cancer. The four principal subjects of the congress and their introducers are the radiological examination of the mucosa of the digestive tract (Dr. Cole, U.S.A.); the pre- and post-operative treatment of cancer of the breast by radiation (recurrency and *metastases* excepted) (Dr. J. E. A. Lynham, England); the radiological examination of the urinary apparatus by excretion of opaque substances (Prof. F. Haenisch, Germany); and the radiotherapy of inflammatory diseases (Prof. E. Milani, Italy). More than 300 communications are announced and will be divided between sections devoted to radiodiagnosis, rontgen and curietherapy, radiophysics, radiobiology, electrology, and natural and artificial heliotherapy. Those attending the congress may visit various holiday and health resorts in France at reduced rates. Membership is open only to members of radiological societies and persons accepted by such societies. Full particulars may be had from the office of the congress at 122, rue la Boëtie, Paris VIIIe.

University of Birmingham.

The Withering lectures will be given by Sir Hubert Bond, H.M. Commissioner of the Board of Control, at the Medical Faculty Building, Edmund-street, on Wednesdays, May 13th and 27th, and June 10th, 17th, and 24th at 4 P.M. The title chosen is Some Correlations between General and Psychological Medicine.—The Ingleby lectures, on Maternal Disablement, will be delivered at the same hour and place on Thursdays, May 21st and June 4th, by Mr. W. Blair Bell, professor of obstetrics and gynæcology in the University of Liverpool.

Post-graduate Demonstrations will be given at the General Hospital, Birmingham, on Tuesdays, and at the Queen's Hospital on Fridays, at 3.30 to 5 P.M., starting on Tuesday, April 28th. Particulars may be had from the Clerk to the Clinical Board of the University, Edmund-street, Birmingham.

Post-graduate Course at Liverpool.

At the Liverpool and District Hospital for Diseases of the Heart there will be a post-graduate course in cardiology from May 4th to 15th from 3.30 to 5.30 P.M. each week-day except Saturday. The course is limited to 20 members and application should be made to Miss Lewis at the hospital.

Journées Médicales Coloniales.

In connexion with the International Colonial Exhibition in Paris this summer there will be a congress of colonial medicine from July 22nd to 30th, under the presidency of Prof. L. Tanon. The secretary-general is Dr. Boyé, 112, Boulevard Haussmann, Paris.

Annual Conference on Social Work.

The conference this year is organised by the Association of Hospital Almoners, and will be held at Bedford College, Regent's Park, during the week end, April 25th–27th. The main theme of the discussion will concern the development in social work since the beginning of the present century. The principal meeting on April 25th will be addressed by Prof. Carr-Saunders, when Sir Harold Morris, K.C., President of the Industrial Court, will be in the chair. Prof. Cyril Burt, D.Sc., will address a meeting on April 26th on the new methods of treating the "Difficult Child."

Medical Tour in Spain.

A third tour for medical men to the spas and climatic resorts in the north of Spain, to last ten days, is being arranged. The party will leave Santander about the middle of July for Covadonga, Pics de l'Europe, Cote Asturias, Coruña, Santiago de Compostela, Vigo, and other places. It is hoped that certain Portuguese stations may also be visited. The cost from Santander will be 1200 French francs. Further information may be had from Dr. Mariano Mañeru, Ronda del Condo Dunque 4, Madrid. The list will close on or before May 15th.

Royal Sussex County Hospital.

A new theatre block was opened at this hospital by Lord Moynihan on April 16th. Events during the past few years have shown the necessity for the new operating theatres; there were 3212 in-patients during 1930, and no fewer than 2535 operations in the then existing theatres. The total cost of the new block has been £15,500, towards which a grant of £5000 was received from the estate of Mr. Bernhard Baron.

Addressing a large gathering, Lord Moynihan declared that he did not share the opinions of those who were saying that the principle of voluntarism in connexion with hospitals was decrepit and moribund, out of tune with the times, and not fulfilling its obligations to the community. The voluntary system in this country, outside London, had an income of £1,250,000 more than its expenditure, and was adding not fewer than 1000 beds every year to the number of those already in use in hospitals. If a business firm was doing this the word moribund would hardly be suggested as appropriate. In his judgment the voluntary principle was not dead; it was still in its infancy. It did, however, require a much better organisation than it had ever yet received in the great majority of towns throughout the country. Having described the functions of hospitals as "the criminal investigation department, where the secrets of disease are searched out," Lord Moynihan proceeded to pay a warm tribute to both doctors and nurses, incidentally hoping that there would be more adequate remuneration for nurses and greater provision for their future. Speaking of the new theatre block, he said he had never seen anything better in any institution that he had visited in his life. Moreover, the whole spirit of the hospital was quite admirable. After being appointed a life governor of the hospital, Lord Moynihan accepted for the operating theatres fund a cheque for £55 10s. contributed by the nursing staff.

New Public Assistance Hospital at Bromsgrove.

Worcestershire County Council is about to erect a new hospital of 100 beds at Bromsgrove.

Paying Patients at Hendon.

A new block of buildings costing nearly £20,000 is to be added to Hendon cottage hospital for the provision of wards for paying patients.

Central London Ophthalmic Hospital.

The annual report states that a clinic for patients insured under the National Health Insurance Act has been started. Last year subscriptions increased, but endowment, equipment, and maintenance are causing the governors some anxiety. The average weekly cost of maintaining a patient was £2 14*s.* 7*d.*

Donations and Bequests.

By the will of the late Mr. W. Cameron of Kilmarnock, the Kilmarnock Infirmary will receive £10,000, the Royal Infirmary, Glasgow, the Royal Western Infirmary, Glasgow, and the Victoria Infirmary, Glasgow, £2000 each, the Cancer Hospital, Glasgow, £1000, and the Eye Infirmary and the Samaritan Hospital £500 each. After large sums to other charities half the residue of the property will go to the Kilmarnock Infirmary.

National Association for the Prevention of Tuberculosis.

The seventeenth annual meeting of this Association will be held at Margate from June 25th to 27th, with Sir Arthur Stanley in the chair. The subject of the conference is the protection of the child from tuberculosis, and on the first morning short introductory addresses will be given by Sir Robert Philip, Dr. Eugene L. Opie (U.S.A.), and Dr. Letitia Fairfield. At subsequent sessions the speakers will include Dr. Reginald Jewesbury, Dr. Nathan Raw, Dr. R. Stenhouse Williams, Prof. S. Lyle Cummins, Sir Henry Gauvain, Dr. T. R. Elliott, Dr. R. H. Crowley, Dr. Midgley Turner, and Dr. L. S. T. Burrell. Visits will be paid to many local institutions.

King Edward's Hospital Fund.

In aid of this fund a series of "Indictments" will be held at the London School of Economics, Houghton-street, Aldwych, W.C., at 5.30 P.M., on Tuesdays, from May 5th to June 16th. At the first Mr. St. John Ervine will defend himself against the charge of being unduly critical, the prosecutor being Lady Rhondda and the judge Mr. Theobald Mayhew. At the second, Father Ronald Knox will be charged with being "Torquemada" of the *Observer* and fraudulently concealing the fact, and at subsequent meetings Miss Megan Lloyd George will be accused of following in father's footsteps, Mr. Gilbert Frankau of defaming the modern young person, and "George A. Birmingham" of encouraging illiteracy. Tickets may be had from the secretary of the fund, 7, Wallbrook, E.C. 4, or at the doors.

Appointments

CADDY, ADRIAN, M.D. Lond., F.R.C.S. Eng., has been appointed Surgeon to the Royal Westminster Ophthalmic Hospital.

MANNERS, R., M.B., B.S. Durh., Hon. Physician to the Stockton and Thornaby Hospital.

The Ross-shire County Council have appointed Dr. DANIEL JOHNSTONE, Assistant Medical Officer of Health with school inspection duties, and Dr. FRANCIS SUTHERLAND, Assistant Medical Officer of Health.

London County Council: AVERY, J. C. H. (Miss), L.R.C.P., Lond., M.R.C.S., Assistant Medical Officer, St. Benedict's Hospital. PURVES, J. E., M.B., Ch.B.Edin., F.R.C.S. Eng., Senior Assistant Medical Officer, New End Hospital. WOOD, J. L. M., L.R.C.P. Lond., M.R.C.S., L.M.S.S.A., D.P.H., Assistant Medical Officer, New End Hospital. NIGHTINGALE, G. S., L.R.C.P. Lond., M.R.C.S., Assistant Medical Officer, Queen Mary's Hospital, Sidcup.

Certifying Surgeons under the Factory and Workshop Acts: ATKEY, P. J., L.R.C.P. Lond., M.R.C.S. (Woking); GROOME, W., M.B., C.M. Glasg. (Margate); PROUDFOOT, MARY E., M.B., Ch.B. St. And., and SAUNDERS-JACOB, E. VIRGINIA, Asst. Medical Officers, Woolwich Borough Council.

Vacancies

For further information refer to the advertisement columns.

Bangor, Caernarvonshire and Anglesey Infirmary.—Hon. Surg.

Bath, Royal United Hospital.—Asst. H.S. £120.

Birkenhead General Hospital.—H.P. £100.

Birmingham, Dudley-road, Hospital.—Jun. Asst. M.O.'s. Each at rate of £200.

Birmingham, Queen's Hospital.—Cas. H.S. £70.

Birmingham Royal Cripples Hospital.—H.S. At rate of £200.

Birmingham University, Faculty of Medicine.—Chair of Anatomy. £1100.

Bradford Royal Infirmary.—H.P. and H.S. Each £150.

Brighton, Royal Alexandra Hosp. for Sick Children.—H.P. £100.

Burnley, Victoria Hospital.—H.P. At rate of £150.

Burton-on-Trent, County Borough.—Deputy M.O.H. &c. £600.

Burton-on-Trent General Infirmary.—Sen. and Jun., H.S.'s [illegible] and £150 respectively.

Cardiff Royal Infirmary.—H.S. to Ophth. Dept. At rate of £75.

Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Third Res. H.S. At rate of £75.

Charing Cross Hospital, Strand, W.C.—Clin. Asst. to Skin Dept.

Chelsea Hospital for Women, Arthur-street, S.W.—Surgeon.

Chesterfield and North Derbyshire Royal Hospital.—H.S.

Cheyne Hospital for Children, Cheyne-walk, Chelsea, S.W.—Hon. Surgeon for Diseases of the Throat, Nose, and Ear.

Derby, Derbyshire Royal Infirmary.—Hon. Asst. Physician.

Dumfries and Galloway Joint Sanatorium Board.—Asst. Med. Supt. £300.

Durham County Hospital.—H.S. £150.

Great Yarmouth General Hospital.—H.S. £140.

Grove Park Hospital, Lee, S.E.—Sen. Asst. M.O. £500.

Hampstead General and North-West London Hospital, Haverstock-hill, N.W.—Cas. M.O. At rate of £100.

Hospital for Epilepsy and Paralysis, Maida Vale, W.—Hon. Asst. Physician.

Hove Borough, &c.—M.O.H. £1000.

Hull Royal Infirmary.—H.S. to Ophthal. and Ear, Nose and Throat Depts. At rate of £150.

Ilford Isolation Hospital.—Temp. Res. M.O. £350.

Ilford, King George Hospital.—Two Hon. Anæsthetists. Each £50

Jersey General Hospital and Poor-law Infirmary.—Visiting Physician and Radiologist.

Leeds, Herzl Moser Hospital, Leopold-street.—R.M.O. £100.

Lincoln County Hospital.—Jun. H.S. At rate of £150.

Liverpool, City of.—M.O. £1800.

Liverpool, Eye and Ear Infirmary.—H.S. to Ophth. Dept. £100.

London Hospital, E.—Asst. Phys. to Children's Dept.

London University.—Studentship in Physiology. £100.

Macclesfield, Cheshire County Mental Hospital.—Asst. M.O. £350.

Macclesfield General Infirmary.—2nd H.S. At rate of £150.

Manchester Babies' Hospital, Burnage-lane, Levenshulme.—Jun. Res. M.O. At rate of £50.

Manchester Ear Hospital, Grosvenor-square, All Saints.—H.S. At rate of £150.

Manchester, Royal Children's Hospital, Pendlebury.—Res. Surg. O. At rate of £125.

Manchester, Royal Infirmary.—H.S. for Central Branch, Roby-street. At rate of £100.

Manchester, St. Mary's Hospital.—H.S. for Whitworth Park Hospital. At rate of £50.

Middlesex County Council.—District M.O. and Public Vaccinator for Parish of Harefield. £45.

Mildmay Mission Hospital, Austin-street, Bethnal Green, E.—Sen. Res. M.O., Asst. Cas. O. and Jun. Res. M.O. At rate of £140, £125, and £100 respectively.

Newcastle-upon-Tyne Education Committee.—Asst. School M.O. £500.

Newcastle-upon-Tyne, Hospital for Sick Children.—H.S. At rate of £100.

Northern Hospital, Winchmore-hill, N.—Asst. M.O. £350.

North-Western Fever Hospital, Lawn-road, Hampstead, N.W.—Two H.P.'s. Each at rate of £80.

Nottingham General Hospital.—H.S. At rate of £150.

Oldham, Royal Infirmary.—H.P. and Cas. O. Each at rate of £175.

Pendleton, Hope Hospital.—Asst. Res. M.O. At rate of £250.

Plymouth, South Devon and East Cornwall Hospital.—Res. Surg. O. and H.S. At rate of £150 and £100 respectively.

Queen's Hospital for Children, Hackney-road, E.—H.P. At rate of £100. Also Cas. O. At rate of £100.

Radium Institute, Riding House-street, W.—H.S. At rate of £150.

Reading, Royal Berkshire Hospital.—Cas. O. and Res. Anæsthetist. Each at rate of £150.

Rotherham Hospital.—H.P. £180. Cas. H.S. £150.

Royal Chest Hospital, City-road, E.C.—Res. M.O. Also H.P. at rate of £150 and £100 respectively.

Royal Eye Hospital, St. George's Circus, Southwark, S.E.—H.S. and Asst. H.S. At rate of £150 and £100 respectively.

Royal Free Hospital, Gray's Inn-road, W.C.—Sen. Res. M.O. £150. Also Asst. Surgeon and Asst. Surgeon to Ear, Nose and Throat Dept.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Cas. O. for Out-patient Dept. £150.

St. Bartholomew's Hospital, E.C.—Asst. Physician-Accoucheur.

St. Helens Hospital.—H.S. £200.

St. John's Hospital, Lewisham, S.E.—Res. H.S. At rate of £100.

St. Leonards Hospital, Hoxton-street, N.—Asst. M.O. £350.

Samaritan, Free Hospital for Women, Marylebone-rd.—H.S. At rate of £100.

Scunthorpe and District War Memorial Hospital.—Second Res. Surgeon. £150.

Southport General Infirmary.—Jun. H.S. £100.

Stockport Infirmary.—H.P. £175.

Sunderland, Durham County and Sunderland Eye Infirmary.—Two H.S.'s. Each £350.

Swansea General and Eye Hospital.—Cas. O. £200.

Taunton, Taunton and Somerset Hospital.—H.P. £100.

Wallasey Victoria Central Hospital.—Jun. H.S. At rate of £100.

Walsall General Hospital.—H.S. At rate of £150.

Walsall Manor Hospital.—Jun. Res. Asst. M.O. £150.

Warrington Infirmary and Dispensary.—Anæsthetist. £150.

West Bromwich, Hallam Hospital.—Res. H.S. £250.

Western Ophthalmic Hospital, Marylebone-road, N.W.—Sen. Res. and Jun. Non-Res. H.S.'s. At rate of £150 and £100 respectively.

Wigan Infirmary.—H.S. At rate of £150.

Wrexham and East Denbighshire War Memorial Hospital.—Two Res. H.S.'s. Each at rate of £150.

York County Hospital.—H.S. £150.

The Chief Inspector of Factories announces a vacant appointment for a Certifying Factory Surgeon at Henley-in-Arden (Warwick).

NOTES, COMMENTS, AND ABSTRACTS

HOMER'S SURGEONS: MACHAON AND PODALIRIUS.

BY S. WOOD.

(From the Library, Royal College of Surgeons of England.)

PART II.*

Podalirius.

So far as we know, Podalirius, the younger son of Æsculapius, was also born at Tricca in Thessaly. References to his life and work are disappointingly few but there is something of romance by way of compensation, and he is of importance as being the ancestor, through Hypolochus, one of his sons, of the great Hippocrates. According to Arctinus [41] he was endowed with great precision of mind, with the power to recognise hidden diseases, and to cure chronic maladies. He it was who first perceived by his glittering eyes and depression of spirits the insanity of Ajax.

In the *Iliad* his name occurs twice only, while that of his brother, who was chiefly a surgeon, is mentioned 11 times. This circumstance may be explained by the fact that injuries sustained in battle would naturally come under the care of the surgeon rather than that of the physician. Quintus Smyrnæus [42] shows him as the possessor of a "kwick-kure" salve which healed wounds in a miraculous fashion:

. . . . Then their bruises and their scars
Did Podalirius tend with loving care
First presses he out black humours, then his hands
Deftly knit up the gashes, salves he laid,
Thereover, given him by his sire of old,
Such as had virtue in one day to heal
The deadliest hurts, yea, seeming-cureless wounds.
Straight was the smart assuaged, and healed the scars
Upon their brows and 'neath their clustering hair.

Podalirius took an active part as medical man and warrior in the Trojan war and helped to sack the kingdom of Priam. On his return from the expedition his vessel was cast by a tempest upon the Isle of Scyros,† where he was washed up safe and sound. He wandered alone in the peninsula of Caria until he became the guest of a shepherd, who, as soon as he learnt that his visitor was skilled in medicine, conducted him to King Damethus, whose daughter Syrna had fallen from the top of a house and lay seriously injured. The young princess was unconscious and motionless and was already regarded by her friends as dead, but the clever Podalirius bled her from both arms and had the happiness of recalling her to life.[43] Damethus, full of gratitude, gave his daughter to Podalirius in marriage, together with the peninsula of Caria, or the Chersonese as a wedding gift. Differing from the majority of writers Gordon [44] ascribes the girl's trouble to the "falling sickness" and says that in marrying her Podalirius was among the first, if not the first, medical practitioner to be conquered by a fair and interesting patient.

A Chersonese is a tract of land which is an island except where it is joined to the main by a narrow neck of land. The king's gift to Podalirius, according to Le Clerc [45] was not the Achaian peninsula called Polaponnesus lying between the Aegean and Ionian Seas, but the Thracian‡ between the Propontis and the Euxine Seas.

In the Carian Chersonese he founded the town of Syrna and likewise another which he called Bybassus, the name of the shepherd who succoured him after his shipwreck.[46]

The First Venesection.

The operation by Podalirius on the princess is said to be the first example of venesection performed as a curative measure, but unfortunately it is not very authentic. Etienne de Byzance, who reported the incident in the fifth century or 1600 years after the operation took place, does not say whence he derived his information. There is no certain knowledge of the origin of venesection, although an ancient tradition of the Egyptians seems to indicate that it was of their invention.[47] We know that it was practised long before Hippocrates, for in various places he speaks of it as a common operation in his time. Pliny,[48] in his usual manner, introduces a fable to account for the discovery of phlebotomy. "The hippopotamus," he says, "when too bulky by overfeeding goes to the reeds by the river and, choosing a stump that is very sharp, presses himself against it and wounds a vein in the thigh which is allowed to bleed till the body is relieved, after which the wound is covered with mud." Thus according to Pliny were the beneficial effects of bleeding first demonstrated to man, but the story cannot be credited by those who know the natural history of the animal.

Podalirius. (Reproduced from the title-page of John Woodall's "The Surgeon's Mate," London, 1639.)

Podalirius is said by Quintus Smyrnæus [49] to have cured Philoctetes of his lameness, and although the induction of the curative sleep appears to be more probably the work of the physician-brother, the successful treatment of this case is usually attributed to Machaon. Podalirius had several children, among them being the son Hypolochus from whom, as mentioned above, Hippocrates was descended. As is well known, the snake is frequently present in the early history of medicine and it is related that Alexander, an impostor, kept a very tame one, pretending it to be the son of Podalirius. Le Clerc [50] says this account is erroneous and that the quack called the snake Æsculapius and himself the son of Podalirius.

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* Part I. appeared last week.

† There is much confusion regarding the geography of Podalirius. The present day Isle of Scyros is far from Caria, where he met the shepherd. Pausanius (Lib. 3, Ch. 26, p. 449) says positively that Scyros was opposite the Carian peninsula, from which the island depends. Sprengel considers Scyros to be identical with Nisyros and this opinion is supported by the position of Bybassus, the town founded by Podalirius, which was situated on the Cnidian peninsula, the only substantial prolongation of land on the Carian coast to fulfil the description of a chersonese.

‡ Le Clerc here seems to be in error. The projection of land of which he speaks between the sea of Marmora and the Black Sea has not the shape of a chersonese; moreover, it is on an opposite course from that which Podalirius would take homeward to Thessaly, and it is improbable that this part of the country would come within the sovereignty of King Damethus. The Chersonese Thracia of antiquity is the present Gallipoli, and for Podalirius to be wrecked here it is necessary to assume that he was so unskilful a mariner as to begin his voyage from Troy in a tempest.

Apollodorus [50a] writes that when Troy had been laid waste Podalirius and others left their ships in Ilium and journeyed by land to Colophon, where they buried Calchas the diviner, one of their number, who died heart-broken through wrangling with a better diviner than himself whom he met in Mopsus.

His Death and Burial.

Lycophron asserts that Podalirius was assassinated on the coast of Ausonia in the country of the Dauni who afterwards worshipped his memory. These people bathed in the river Althenus and listened while resting on the skins of animals to the infallible oracles of the god of medicine. He had a shrine at the foot of Mount Drium in Daunia, and because of this Lycophron said that he was buried in Italy, and for so saying was severely taken to task by his learned but crabbed commentator Tzetzes [51] who roundly accused him of lying.

Strabo [52] says that the tomb of Podalirius may be seen a hundred stadia from the sea in the country of the Dauni, the capital of which, Luceria, existed at his time in the Capitanata at the bottom of the Gulf of Manfredonia, and he adds that the waters of the river Althenus, by virtue of the presence of the tomb, were a sovereign remedy for the diseases of cattle.

According to another story Podalirius went to Delphi and inquired of the oracle where he should dwell. He was told to take up his abode in that city in which, if the sky fell, he would suffer no harm. So he settled in a place in the Carian Chersonese, which was surrounded by mountains that might be expected to prop up the sky in case it were to fall. Yet another story, followed by Lycophron, is that he went to Apulia in Italy, where he died and was buried, and that his spirit gave oracles in dreams to such as slept on sheepskins laid on his tomb.[53]

His name is commemorated in science by being applied to one of the subdivisions of the natural order of plants, Papilionaceae—namely, the Podalyriæ.[54] Rees,[55] the Cyclopædist, is surprised that Podalyrius should have been given a botanical association, overlooking the fact that he was learned in the properties of drugs of "pain-assuaging" power, which were certainly infusions of herbs, and that on the death of his brother he was found by Nestor seeking amongst his herbs for a deadly substance to destroy himself.

Diodorus of Sicily in his account of the brothers says that they lived and worked together in perfect harmony and acquired such a reputation among their companions that they were exempt from fighting and the fatigues of warfare. However, they did not avail themselves of this privilege, for, as we have seen, they took a leading part in the attacks on the Trojans and appeared to treat surgical cases as incidents which cropped up amidst their "valorous deeds."

They are said by Apollodorus [56] to have been among the suitors for the hand of the beautiful Helen of Troy, which appears to have been the fate of any man who had the misfortune to gaze upon her supernatural charms. The courage of her suitors must have been of a high order to enable them to woo a being of whom Marlowe in his "Faustus" exclaims,

> "Oh! thou art fairer than the evening air
> Clad in the beauty of a thousand stars!"

Portraits of the Brothers.

In addition to the reproductions in this paper the subjects of these notes appear in portraiture as follows: Daremberg [57] reproduces a plate showing Machaon dressing Menelaus's wound, the position of which bears little relation to Homer's text. The scene is also figured in Plate XV of a Greek manuscript published by Cardinal Mai,[57] but the artist has placed the wound just above the knee, whereas it should be in the region of the flank. T. Cades [59] reproduces a pâte de verre representing the same incident. Figure 37 of Daremberg's plate is a side view of the wounded Machaon and Nestor who is lifting the cup to drink the liquor prepared for them by Hecamede. These two figures also appear on a terra-cotta in the Musée du Louvre and in the British Museum, and are illustrated in the historical works of Panofka [60] and Winckelmann.[61] In his book on antique monuments Millen [62] gives a picture of two faces in profile which are said to represent Podalirius and Machaon. On the first head is a soldier's casque, and on the second a physician's cap.

There is a portrait of Machaon in the Van Kaathoven Collection in the Surgeon-General's Office of the United States Army, and a curious small engraving of Machaon, partly cut away by a careless bookbinder, appears on the title-page of Brumfel's "Catalogus illustrium Medicorum," 1529, in the Royal College of Surgeons' Library. Cabanès [63] has an illustration of Machaon and Nestor reproduced from Inghirami [64] in whose work Machaon appears at the healing of Philoctetes, and dressing the wound of Menelaus. Pausanius says that the Messenians had in the temple of Æsculapius amongst many great curiosities a sort of family piece of painting wherein was Æsculapius, his mother, and his two sons Machaon and Podalirius, drawn by Omphalion.[65] Pausanius also refers to the tomb of Machaon at Gerenia, which was a sanctuary where the sick were made whole. The inhabitants named the sacred place Rhodus, and here stood an image of Machaon in bronze, on the head of which was a wreath called in the local dialect "kiphos."

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45. Le Clerc: History of Physick, 1699, p. 65.
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48. Pliny: Natural History, Bk. 7, Ch. 40, Bostock and Riley Edit.
49. Quintus Smyrnæus: Fall of Troy, Bk. 9.
50. Le Clerc: History of Physick, London, 1699, p. 80.
50a. Apollodorus: Frazer's translation, ii., 243.
51. Tzetzes: Schol. on Lycophron.
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53. Pausanias: Laconia, Ch. 26.
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56. Apollodorus: Frazer's translation, ii., 27.
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60. Panofka: Bilder antiken Lebens, Pl. 7, Figure 3.
61. Winckelmann: Monumens inedits de l'Antiquite, 1808, ill. 127.
62. Millen: Monumens Antiques, 1802–6, vol. ii., pl. 30.
63. Cabanès: Chirurgiens et Blessés a travers l'Histoire, 1912.
64. Inghirami, Galleria Omerica, vol. i., pl. 50 and 65; vol. ii., pl. 117.
65. Le Clerc: History of Physick, p. 83.

ASSOCIATION OF MATERNITY AND CHILD WELFARE CENTRES.

THE slight alteration in title of the society known since its foundation in 1911 as the Association of Infant Welfare and Maternity Centres is part of a new constitution rendered necessary by reorganisation of the Association's work consequent on the voluntary liquidation of the National League for Health, Maternity and Child Welfare, and adopted at last year's annual meeting. The report for 1930 records the affiliation of 28 new centres, including one in Rhodesia and some in India, and speaks of lively activity in the employment bureau, where 904 applicants were registered as compared with 689 in the previous year. The publications department was slightly less busy than in 1929, though its sales again numbered over 300,000 and proved a useful source of income. Two of the Association's most humane activities are the conduct of the Tired Mothers' Holiday Fund and of the Babies' Homes Department. During the year 25 mothers were helped to go for holidays, a grant up to £3 being made where a mother can arrange to be away for a fortnight, either going alone or taking one child. The John Madocks home for babies at Basing and the Arkley home for toddlers at High Barnet were constantly in demand, and many children had to be refused for lack of accommodation. Both these homes, as well as the babies' hotel at Clapham Park, act as training schools for nursery nurses, and the Association also helps in the administration of the Creagh Nursery Training School, which has established a high reputation for the standard of nurses sent out. In collaboration with the National Council for Maternity and Child Welfare statistics and other material were collected for the maternity and child welfare section of the museum of the London School of Hygiene and Tropical Medicine. The record is one of many-sided usefulness cramped by financial anxiety.

THE INSTITUTE OF RAY THERAPY.

THE Camden-road Institute was officially opened on March 13th of last year, and its first annual report shows that it is filling a real need. It has been open from 2 to 9 P.M. every weekday, except for a period of redecoration in December, and already 1450 patients have been seen, the average of new patients being 28 every month. The total number of attendances is over 40,000, as each patient receives on an average 27 treatments. The industrial depression of this winter reduced the number, as many patients were unable to afford even their fares and left their course of treatment incomplete. The Institute has paid its way on current expenditure, with the help of a number of approved societies and business firms; a canteen for patients, opened in May, has been self-supporting. An appeal for subscriptions and donations will, however, be necessary in the near future in order to pay off the capital expended. Patients are only received on a letter from their medical practitioner. The chief affections treated have been rheumatic and nervous conditions, debility, asthma, bronchitis, skin diseases, and children's ailments, but the numbers are not considered to be sufficient for the publication of statistical results. Of the 574 patients discharged by the medical director, 83·6 per cent. were fit or much improved, while 16·4 per cent. showed no signs of improvement. The patients include old-age pensioners, workers at an immense variety of trades, and children, for whom special arrangements have been made for treatment outside school hours. The Institute has been recognised by the Society of Apothecaries as a training centre in therapy for the biophysical assistants' examination.

DISEASE IN THE PRE-SCHOOL YEARS.

AT a meeting of the Society of Medical Officers of Health on April 17th, at which Prof H. Kerr (Newcastle-on-Tyne) took the chair, Dr. Ethel Cassie showed a chart, drawn up from her observation of cases in Birmingham, which recorded the incidence of such conditions as rickets, otorrhœa, enlarged tonsils, lung infections, and many others, in children grouped according to age, from 18 months to 5 years. With many of these conditions, notably with enlarged tonsils, defective teeth, orthopædic defects, lung infections other than chronic bronchitis, defective hearing, and squint, the percentage incidence rises steadily in the increasing age-groups, reaching a maximum between 4 and 5 years. With defective teeth the rise is from 2·3 per cent. in children under 2, to 52·3 per cent. in children between 4 and 5. Dr. Cassie emphasised the need for the education of parents in the better training and management of children during the early years, education which she believes should be given at the child welfare centres; she appears to be able to secure the attendance of the child up to school age at Birmingham, but neither she nor Dr. G. C. M. M'Gonigle (Stockton-on-Tees), who spoke after her, outlined a constructive scheme by which the pre-school child could receive regular medical supervision all over the country. Dr. M'Gonigle attacked another aspect of the problem; he pointed out that it was at present exceptional to find a physically perfect child of 5, a fact which indicated some radical fault in the nurture of young children. In his opinion the initial error is far more often nutritional than environmental; the frequency with which the diet of the expectant mother and the young child is deficient in vitamin content, especially A and D, is responsible, he considers, for the high incidence of dental disease, and he advocates the administration of cod-liver oil to pregnant women as a routine.

In this view he is opposed by Dr. Sim Wallace (London) who quoted the high incidence of dental disease in Hawaii, where sunshine is abundant and rickets said to be rare. Dr. R. M. F. Picken (Cardiff) considers that any scheme which is to include the care of the child between 1 and 5 should make it possible for the same doctor to attend him from infancy to the end of school life, an arrangement which calls for some ingenuity in the organiser, but which both he and Dr. Agnes Nicoll (Willesden) have attempted. The difficulty is to persuade the parents to bring their children to the clinics once they have passed the dangers of infancy; Dr. John Macmillan (Woolwich) has managed to secure the attendance of a certain number by sending the health visitor round on the day before the clinic to obtain promises of attendance. At first out of 30 promises, 7 mothers would attend, but now, after eight months, it is common to secure 20 attendances from 24 acceptances, which suggests that the mothers are as educable in the care of their pre-school children as they were in the care of infants when the welfare centres were first started. Dr. E. H. T. Nash (Hounslow) believes that the best way to provide supervision for these children is to extend the nursery school system, under which they will receive not only medical attention, but adequate nurture, and such psychological training and guidance as is now regarded as essential in the early years.

OPERATIVE TREATMENT OF PILES.

REFERRING to an annotation on his modified clamp-and-cautery method of treating piles (THE LANCET, March 14th, p. 598), Dr. David Warshaw (Albany, N.Y.) writes: "One important point seems to have been *misunderstood by your abstract* editor—namely, his criticism that there is no assurance of protection of the deeper tissues against injury by the technique I described. Careful perusal of the article will reveal the fact that monopolar current is used. This current cannot penetrate beyond the clamp, as the clamp itself takes up any excess current which the operator may use."

We regret having given a wrong impression of Dr. Warshaw's method. The mistake arose from a misreading of the word diathermy. In this country all diathermy machines produce a bipolar current which has considerable penetrating powers. It appears that the machine which Dr. Warshaw employs is monopolar and produces a local spark with no power to penetrate the tissues. *In this country* "high-frequency" rather than "diathermy" would be the term used in describing the method.

NASAL DISINFECTION.

Dr. William Stanwell (New Milton, Hants) suggests the disinfection of contacts and carriers of cerebrospinal fever by a method he has found useful in dealing with whooping-cough. An ointment is made by *melting* together vaseline, 1 lb.; menthol, 2 *drachms*; *medical* izal, 4 drachms. Two drachms of this ointment are packed with a spatula into the nostrils of a recumbent patient whose head is thrown well back, and who remains in this position until the ointment has melted and reached every part of the nasal cavity. This treatment he has found to cut short an attack of whooping-cough and to do away almost entirely with the violent paroxysms of cough.

NEW PREPARATIONS.

ABRODIL (Bayer Products, Ltd., 19, St. Dunstan's-hill, London, E.C.) has already been described in the columns of THE LANCET in reviewing a paper on excretion urography by Drs. H. Bronner and J. Schueller, of Cologne. It is the sodium salt of mono-iodo-methane-sulphonic acid. After intravenous injection of large doses no inorganic iodine is found in the urine of rats, cats, and dogs, and this shows that it is excreted by the kidneys without the splitting off of iodine. It is also strongly diuretic. The diuresis is mainly in the first half hour, and the best pictures for the purposes of pyelography are therefore obtained during that period, the ideal time being usually 15 to 20 minutes after injection. Drs. Bronner and Schueller have tested abrodil as a medium for retrograde pyelography, and recommend for this purpose a 15 to 20 per cent. solution. The fact that abrodil is compatible with oxycyanide of mercury allows of its being used in conjunction with this antiseptic. The danger of sepsis is thereby diminished, and the surgeon is relieved of one of the anxieties uppermost in his mind when undertaking retrograde pyelography.

SOMNOSAL (Messrs. H. R. Napp, Ltd., 3 and 4, Clement's-inn, London, W.C.) is a combination of a brom-iso-valerianyl urea (grs. 5) with dimethyl-amido-phenyldimethyl-iso-pyrazolon (grs. 2·5). The preparation dissolves in alcohol and the usual solvents but is only partly soluble in water. It is put on the market as a trustworthy sedative of negligible toxicity, whose employment is unaccompanied by secondary symptoms or habit forming. A considerable amount of medical evidence is adduced of the utility of the preparation, which is free from barbiturates and opiates.

From the same firm we have received a sample of ANOTAL, a combination of phenyl-cinchoninic acid and ethyl-urethane. The manufacturers claim satisfactory results for the new preparation in the treatment of rheumatism, gout, and local inflammations, the analgesic action being rapid, while medical evidence is adduced that it is well tolerated by patients who suffer from no gastric disturbance or cardiac depression if the suggested dosage is observed. Anotal is put up in phials of 30 tablets, and in bottles of 300, the dosage being one or two tablets, to be taken in cold water thrice daily, according to medical direction.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, April 27th.—8 P.M., ODONTOLOGY. Paper. Mr. Wilson Charles: Full Denture Prosthesis. 5 P.M., MEDICINE. Short Papers: Dr. W. S. C. Copeman: Treatment of Chronic Arthritis by Blood Transfusion. Dr. Donald Hall: Two Unusual Electrocardiograms. Dr. Donald Hunter: Hæmatogenous Myelomatosis. Dr. M. Schwartzman: Skeletal Muscular Extract in the Treatment of Vascular Diseases. Dr. D. C. Wilson: Osteomalacia with Cinematographic film.

FRIDAY, May 1st.—10.30 A.M., OTOLOGY (Cases at 9.30 A.M.). Annual General Meeting. Papers. Dr. Schmaltz (Germany): The Physical Phenomena Occurring in the Semicircular Canals during Rotatory and Thermic Stimulation. Dr. H. W. Barber: Eruptions Involving the External Auditory Meatus. Discussion: Non-malignant Diseases of the External Ear and Auditory Meatus. Cases and specimens will be shown. 5 P.M., LARYNGOLOGY (Cases at 4 P.M.). Annual General Meeting. Communication. Prof. Georges Portmann: A Big Tumour of the Deep Regions of the Face removed by Operation with Cure. Discussion: Obstruction at the Upper End of the Œsophagus (excluding Pharyngeal Diverticula). Openers: Dr. A. Brown Kelly and Dr. D. R. Paterson. 8.30 P.M., ANÆSTHETICS. Annual General Meeting. Election of Officers and Council. A Clinical Evening will follow.

EUGENICS SOCIETY.

TUESDAY, April 28th.—5.30 P.M. (at the Rooms of the Linnean Society, Burlington House, London, W.), Dr. A. J. Lewis: Genetic Problems in Psychiatry.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.

FRIDAY, May 1st.—8.30 P.M. (at West London Hospital, Hammersmith): Discussion on Cholecystitis. (Opener: Dr. Maurice Shaw.)

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, April 27th, to SATURDAY, May 2nd.—HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C. Special post-graduate course in Diseases of Children occupying mornings only with lectures, demonstrations and operations.—INFANTS HOSPITAL, Vincent-square, S.W.—Special afternoon course in diseases of infants. Demonstrations, lectures, and special visits.—MAUDSLEY HOSPITAL, Denmark-hill, S.E. An afternoon course of lectures in Psychological Medicine. Clinical instruction in the Hospital.—CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C. All-day Course in Diseases of the Ear, Nose, and Throat, lectures, demonstrations, &c.—Further particulars from the Fellowship of Medicine.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL, University-street, Gower-street, W.C.

WEDNESDAY, April 29th, and the following THURSDAY and FRIDAY.—5.30 P.M., Prof. Otfrid Förster (Univ. of Breslau): Neurology.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE, Keppel-street, Gower-street, W.C.

TUESDAY, April 28th, and following WEDNESDAY, THURSDAY, and FRIDAY.—5 P.M., Prof. F. A. E. Crew: Laws of Inheritance.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.

WEDNESDAY, April 29th.—4 P.M., Dr. Hubert Oddy: Treatment of Gastric Ulcer.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, April 28th.—4.15 P.M., Mr. J. P. Buckley: Some Problems of Early Diagnosis.

FRIDAY, May 1st.—4.15 P.M., Mr. P. R. Wrigley: Demonstration of Surgical Cases.

MANCHESTER VICTORIA MEMORIAL JEWISH HOSPITAL, Elizabeth-street, Manchester.

WEDNESDAY, April 29th.—4.30 P.M., Dr. W. Brockbank: The Medical Treatment of Asthma.

UNIVERSITY OF BIRMINGHAM.

TUESDAY, April 28th.—3.30 P.M. (at the General Hospital), Mr. S. Barling: Demonstration of Surgical Cases.

Births, Marriages, and Deaths

BIRTHS.

DE BARGUE HUBERT.—On April 18th, at Grosvenor-road, S.W., the wife of Dr. W. de Bargue Hubert, of a daughter.

MARRIAGES.

AITKEN—WEST.—On April 14th, at Macduff, Banffshire, Alan Boultbee Aitken, of Creigiau, Cardiff, to Dr. Gladys Mary West.

FAIRLEY—ROSSER.—On April 17th, at Saint Augustine's-road, Edgbaston, James Fairley, B.Ch. Camb., to Margaret C. Rosser, M.B., Ch.B.

HOBBES—CAMERON.—On April 16th, at St. Mary's, Selly Oak, Theodore H. Hobbes, M.B., B.S., to Janet Seaton Cameron, M.B., Ch.B.

DEATHS.

ACLAND.—On April 16th, at Bryanston-square, London, W., Theodore Dyke Acland, M.D. Oxf., F.R.C.P., aged 79.

CHRISTIE.—On April 14th, 1931, at 1, Albyn-terrace, Aberdeen, John F. Christie, M.A., M.B., C.M., F.R.C.P.E.

DEAN.—On April 14th, at Abinger-road, Bedford Park, Henry Percy Dean, F.R.C.S., M.S., M.B., B.Sc., aged 66.

HARRIS.—On April 16th, Major-General G. F. A. Harris, C.S.I., M.D., F.R.C.P., I.M.S., in his 76th year.

SMITH.—On April 18th, at Cobden-crescent, Edinburgh, James Lorrain Smith, F.R.S., Professor of Pathology, University of Edinburgh.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

HARROW HOSPITAL.—Last year each in-patient cost an average of £3 5s. 9d. per week, as against £2 12s. in the preceding year. The average total costs of each patient—£7 10s.—includes 844 out-patients. The hospital was closed for six weeks last summer for alterations necessitated by the extension schemes.

ADDRESSES AND ORIGINAL ARTICLES

THE SPLEEN: ITS STRUCTURE, FUNCTIONS, AND DISEASES.

By J. W. McNee, D.S.O., M.D., D.Sc. Glasg., F.R.C.P. Lond.,
ASSOCIATE PHYSICIAN TO UNIVERSITY COLLEGE HOSPITAL, LONDON.

LECTURE I.

The human spleen is of considerable size, easily accessible, and, when enlarged, easily palpable through the abdominal wall. Thus it is not surprising to find far back in the history of medicine numerous records of curious beliefs and speculations about splenic function which were the outcome of the attention paid to this organ by early writers. Yet real knowledge of its intimate structure has accumulated amazingly slowly in comparison with that of other organs of the body. One good reason for this is no doubt the fact, established from the earliest times, that the spleen has not any function absolutely essential for life, and so some less fundamental reasons for its presence in the body had to be discovered.

Early Physiology.

The very earliest views concerning splenic function are not easy to trace, and I am greatly indebted to various friends interested in the history of medicine, and particularly to Dr. Charles Singer, for help in this connexion. Interesting accounts are also contained in the book of Charles Gray (1854), and in the recent review by Krumbhaar (1926).

The spleen was described by Hippocrates in his treatise "De Carnibus," and he states that its function is to draw the watery part of the food from the stomach. Aristotle also described the organ and suggested a somewhat similar function. Nothing further of note emerges until we come to Galen (A.D. 130–200), who rightly termed the spleen an organ "full of mystery." Galen's physiology was built around the hypothesis of the four humours—blood, phlegm, choler, and melancholy. Gradually each humour became associated with a corresponding organ of the body, generally the brain with phlegm, the heart with blood, the liver with choler, and the spleen with "black bile" or melancholy. To fit in with this old physiology a spurious anatomy was invented, and an imaginary duct was traced from spleen to stomach, for the excretion of "black bile." Excess of one or other of the four humours was supposed to produce a phlegmatic, sanguine, choleric, or melancholic temperament, and deficiency the reverse. These ancient views of Galen persisted, and were believed almost universally for more than a thousand years, and Robin in his interesting book, "The Old Physiology in English Literature," states that at the University of Cambridge, in the fourteenth century, medical students were still compelled to attend two full courses of lectures on "Galen's Commentaries upon Hippocrates." The ideas expressed in the Galenic physiology have provided many striking passages for the classical writers of English poetry and prose (see Robin), and even now we may speak of "venting our spleen." Some of the hypotheses known to Galen were also described, but in far less accurate form (as Dr. Singer has assured me) by Pliny (A.D. 23–79). The first translation of Pliny into English is a remarkable volume, published by Philemon Holland in 1601. It is a rare book, but I have seen Dr. Singer's copy, and it is both interesting and amusing. Pliny's writings are of particular interest to us, in that he makes the first definite reference that I have been able to trace, to extirpation of the spleen in runners.

Here is the passage, copied from Philemon Holland's book:—

> "This member hath a proprietie by itselfe sometimes, To hinder a mans running: whereupon professed runners in the race that bee troubled with the splene, have a devise to burne and wast it with an hot yron. And no marveile: for why? they say that the splene may be taken out of the bodie by way of incision, and yet the creature live neverthelesse: but if it be man or woman that is thus cut for the Splene, hee or shee looseth their laughing by the meanes. For sure it is, that untemperate laughers have alwaies *great splenes.*"

As regards the last part of the quotation it will be noticed that Pliny is a little muddled, as is indeed often the case, for on the hypothesis of the four humours it is the melancholics who should have great spleens, and not the laughers. There is a well-known tradition, and perhaps even written evidence, although I have been unable to discover it even after much search, that the spleens of Greek runners even in the earliest times were removed to increase their speed and endurance. Gurlt, in his monumental "History of Surgery," gives no clue to the origin of this tradition, and apart from giving the reference to Pliny, just described, he merely mentions that the subject is referred to in the ancient Hebrew Talmud.

So much for the earliest views concerning splenic function—an interesting story on which a whole series of lectures could be based. After Galen there is little speculative writing to detain us until the seventeenth century, after Francis Bacon had laid the foundations of the renaissance of science.

SUCCESSFUL SPLENECTOMY.

Experiments began, and the first recorded splenectomies were carried out in dogs by Zambeccari in 1680. Malpighi, the discoverer of the lymph follicles in the spleen, had earlier (1665) ligated the splenic vessels in dogs without apparently injuring their health, and later he also performed splenectomy successfully in the same animals. Similar experiments were done by many others, especially in England, and the facts were well known to Stukeley in 1722. Various symptoms, not harmful to health, such as increased frequency of micturition and voracious appetite, were described as sequels to the operation.

The first operation for removal of the human spleen is said to have been performed by Zaccarelli in 1549. Pernet, Moynihan, and Krumbhaar all refer to this case in their accounts of the history of splenectomy. The case is recorded with great circumstantial detail by Fiorovanti (1518–88), who, however, is described by Stukeley as "a famous empiric, and the first mountebank in Europe." The patient was a young woman of 24, named Marulla, wife of a captain, and her spleen was so large as practically to fill the abdomen. The services of Zaccarelli, of Naples, were enlisted, and he successfully removed the spleen, recovery being complete in 24 days. The organ is said to have weighed 32 oz. after removal from the body, which tallies ill with the previous clinical description of its size.

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* The Lettsomian lectures delivered before the Medical Society of London on Feb. 16th and 25th, and March 4th 1931.

Another early case (1676) is of especial interest, if authentic, since it may have been the first human splenectomy performed in this country. It is recorded by Dr. Timothy Clarke (physician to Charles II., and a friend of Pepys) as related to him by a Dr. Turbervile. Here again the reputed facts of the case are given in considerable detail. The patient was a Somerset man, William Panier, who attempted suicide by stabbing himself in the left side with a butcher's knife, so that spleen, omentum, and intestines projected. Three days later a surgeon replaced the intestines, and cut away the spleen and omentum. Recovery to perfect health ensued, and the man was known to be alive years afterwards. Various other curious cases of removal of the spleen after knife wounds are referred to in the literature (Spencer, 1920), and it seems probable that in times of war opportunities for the operation would be offered from time to time. It must be remembered, however, that facilities for publishing such cases in print were extremely limited until 100 years ago.

In more recent times there is the well-known case of Spencer Wells (1866), which is probably one of the first English cases in which the abdomen was deliberately opened and the spleen at once removed, but the patient died one week later. With the advent of Listerian principles of surgery splenectomy was soon frequently performed, but at first the death-rate from the operation was high.

STUDIES OF FUNCTION.

We may return now to a consideration of how real knowledge of the structure and functions of the spleen was acquired, after the influence of Galen and his teaching had waned. We may fittingly commence with the observations of the famous Italian anatomist Malpighi (1665), who not only described the lymph follicles but also noted in dogs that the trabeculæ were muscular and capable of contraction. As to function he considered that the organ was essentially a gland, and although it had no ducts he suggested that the large veins and spongy structure of the organ would adequately suffice for glandular excretion. His final conclusions, however, were quite definite: "What therefore is to be thought of this artificial bowel, I am perfectly ignorant." In 1722, William Stukeley gave his Goulstonian lecture to the Royal College of Physicians of London, On the Spleen: Its Description and History, Use and Diseases. The lecture was published for the author in 1723, and is a most beautiful book, illustrated by his own fine drawings. Stukeley's work is remarkable both for its style and for the ideas expressed, some of which, as shall be seen, were far in advance of his own times. Some of his introductory remarks (page 2) are delightful.

> "The uses of the apparatus [i.e., the contents of the abdominal cavity] are by the industry of the Curious pretty manifest, except that of the Spleen; which yet has not fail'd to be a subject of enquiry in all ages, and has rack'd the brains of physicians, as well as the bowels of their patients. . . . But still, what formerly was the seat of joy [here Stukeley follows Pliny] is become a topic of grief to the moderns, since our improvements have presented us with no other than a negative knowledge therein; and in the main we are forc'd to own our ignorance of nature's intention in forming the curious organ of the spleen."

Stukeley's own views of splenic function are, however, set forth with the utmost clearness, and are of great historic interest in view of recent developments in splenic physiology (Barcroft, Binet, and others). He recognised that this spongy organ could, when filled with arterial blood, "at pleasure upon its contraction" empty itself again. He asserted that the organ served to maintain the balance of the circulation, acting as a sort of diverticulum or safety valve to the general systemic circulation. Some of his remarks are for us even nowadays so apt, that he may be allowed briefly to speak for himself in some sentences from page 50 of his book.

> "I take it for granted that in common way of living we make more blood than is just necessary for the occasions of life; and without this provision, we should be subject to a thousand inconveniences."
>
> "She would be a very imprudent and improvident mother, or rather stepmother, that was so niggardly as only to take care of supplies the moment we want it. So complicated a machine, liable to external injuries and internal disorders, must have a reasonable *overplus*, a stock in hand to be employed whenever there is occasion, and for fear a regular supply should be procrastinated."
>
> "Even regular exercise and muscular motion . . . demand a considerable plenitude of juices; and if there was not more than enough, we should be continually fainting."
>
> "Therefore this so necessary a surcharge of blood, I suppose so regulated by the spleen, as that no inconveniences arise from it." . . .

Stukeley's views were supported in the main by Lieutaud (1738, 1742) and Hodgkin (1832).

If Stukeley's book may be regarded as the "classic" on the spleen in the eighteenth century, then the book of Henry Gray, "On the Structure and Use of the Spleen," published in 1854, holds the same position in the next century. He gives a remarkably full historical account, on which I have freely drawn for these lectures, and also a whole series of interesting observations made by himself. He unfortunately failed, in his experiments, to prove the contractile power of the spleen, and so he gives the organ a much more passive rôle as a regulator of blood-supply than did his predecessor Stukeley.

A contemporary of Henry Gray, the comparative anatomist Kölliker (1849), first noticed the disintegration of red blood corpuscles within the cells of the spleen. This fact was soon amply confirmed by other observers and formed, until very recent years, the basis of the sole function attributed to the spleen in subsequent text-books.

Structure of the Spleen.

It has been convenient to describe the early history of our knowledge of splenic function without much reference to structure, since, if we except Malpighi's discovery of the lymph follicles, little was known except the gross anatomy of the spleen, until the rapid development of microscopic and histological technique in the middle of last century.

We may now, however, turn definitely to the problems of splenic structure, and since my object is to lead up to a consideration of the various forms of splenic disease met with in human beings, I shall confine myself to points in structure which may be important in that connexion. Full reviews of the modern development of our knowledge have been given by Tait and Cashin (1925), and by Hueck (1928). It is seen that most of the important papers date from the middle of last century, and that there is scarcely any agreement among them on fundamental points. It is also obvious that in recent times much of the older work, and its possible significance, has been completely forgotten. It has disappeared, at any rate, from all except some of the largest text-books of histology, and generally the descriptions given of the finer histology of the spleen in student's text-books are very poor and meagre. As soon as I began to be interested in diseases of the spleen, I naturally read the best available accounts of splenic histology, but the extreme divergences of opinion was an unexpected obstacle. Since, however, comparative studies of the structure of the liver lobule in different animals had greatly helped me in the understanding of hepatic disease, I determined to apply the same method to the spleen. In this work I was fortunate in having the coöperation of M. F. Cashin, who had already published work with Tait on the structure of the spleen. I may say at once that this comparative study of the spleens of animals has been of the greatest help in elucidating some of the problems of the complex human spleen. Our observations are given in detail elsewhere, and it should be stated that Gray, Whiting, Magnam, and others have made similar observations in the past, but not since improvements in histological technique, and especially not since recent developments in splenic physiology have been known to us. Reference should also be made here to the careful work of Mills (1927) on the spleen of the skate, and to the recent (unpublished) work of Basin, in Prof. J. P. Hill's laboratory at University College, on the spleen of echidna.

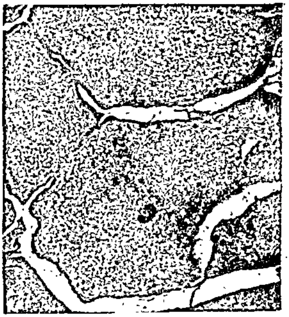
IMPORTANT ANATOMICAL FEATURES.

The following points concerning the structure of the spleen are important for the interpretation of the pathology of human splenic disease. Some of them have been known for many years; others were known but forgotten, and have been rediscovered anew; a few have only been lately recognised.

The spleen of all vertebrates is covered, below the peritoneal coat, by a fibro-elastic *tunica propria* which contains abundant muscle-fibres in some animals, such as the cat and the dog, which have been the subjects of many experiments concerning splenic contraction. In man, however, the muscle tissue of the spleen is chiefly confined to the splenic *trabeculæ*, structures which are not found in all vertebrates, being entirely absent from the fishes. These trabeculæ are definitely muscular, and arise both from the covering tunica propria and from the sheaths of the main blood-vessels. They are obviously of critical importance in relation to the contractility of the organ. The *reticulum* or *reticular network* is a structure often misunderstood, as Tait has pointed out, but it is a most important element in the structure of the spleen. It was first described by Tigri (1847) and again by Billroth (1857), but the name reticulum was first applied by Mall in 1890 to describe the peculiar meshwork in the spleen which, by special microchemical methods, he showed was different from the fibres both of white-fibrous and of yellow-elastic tissue. It has been held by others, however, that such a sharp distinction is not justifiable (R. A. Young, 1892). Ranvier (1891) first described the large multipolar cells lying on the reticular network of the spleen, and these cells, together with large amœbic phagocytic cells first observed by Ponfick (1869), constitute along with the reticulum the essential structures of the spleen-pulp. These cells are now included as an important part of the reticulo-endothelial system (Aschoff). The *Malpighian corpuscles* (Malpighi, 1669) are simply aggregations of lymphocytes, surrounded by a rather denser zone of reticulum than elsewhere. They are to be regarded simply as tiny lymph glands within the spleen, and they behave quite independently of the remainder of the splenic tissue in most human diseases. In our comparative study of the spleens of animals they were found to be inconstant. Fishes have none at all, but they occur in reptilia and all other animals higher in the scale. Some birds' spleens show them to be present, but in others they are absent. In mammals they are always more prominent in the young than in the old, and this is explained by the work of Gross, referred to later on.

The *lobularity of the spleen* is, I believe, a most important fact to take note of, and one which affects many pathological processes. All spleens are essentially lobular in structure, but this has often been forgotten in studies confined to the complex spleens of man and the higher animals. Yet a tendency to lobularity can still be made out by special methods of staining even in the adult human spleen, and, as is noted later, definitely lobulated human spleens are not altogether rare. In fishes, and even more remarkably in reptilia, lobulation is distinct. In one lizard examined (*Veranus niloticus*) the subdivision into lobules is complete, each separate lobule being supplied by its own end-artery. In the spleen of a crocodile Cashin and I calculated that there were probably about three hundred separate lobules.

FIG. 1.



Lacertilia. *Veranus niloticus* (monitor). The lobular structure of the spleen is shown; each lobule has a central artery, and the blood is confined in venous sinuses (low power).

The *vascular system of the spleen* is obviously of critical importance for the development of all pathological processes, but the study of this system has always presented great difficulties and has led to much divergence of opinion which is not yet reconciled. The main blood-supply to the spleen, and the collateral circulation, has an importance both for the surgeon and the pathologist. It has been well studied by Valdoni (1929), an Italian surgeon, with the help of opaque vascular injections and X rays. The splenic artery in man is remarkable for its large size in proportion to the bulk of the organ. As a rule it is a single vessel, breaking up close to the hilum into a number of branches, but occasionally the branching takes place at some distance before reaching the hilum, causing surgical difficulties in an operation for splenectomy. This latter distribution of the branches of the splenic artery is the normal state in many animals. The main branches of the splenic artery within the spleen are tortuous and spring-like; they divide abundantly until, finally, each branch bifurcates to form two slender arterioles named *penicilli* by Ruysch (1696). These penicilli, as was first strongly emphasised by Cohnheim (1867), are end-arteries, and do not anastomose. An important part of the internal vascular arrangement of the spleen is the so-called *ellipsoid*, a structure formerly well known to histologists, but for a long time almost forgotten. The structure and significance of the ellipsoid has been very fully investigated by Tait and Cashin, and the history of its discovery has already been fully described by myself elsewhere. These peculiar structures were first noted by Billroth (1857), and named "kapillar-hülsen" by Schweigger-Seidel (1863), or "ampullæ" by Thoma (1895). They consist essentially of swellings or condensations

Another early case (1676) is of especial interest, if authentic, since it may have been the first human splenectomy performed in this country. It is recorded by Dr. Timothy Clarke (physician to Charles II., and a friend of Pepys) as related to him by a Dr. Turbervile. Here again the reputed facts of the case are given in considerable detail. The patient was a Somerset man, William Panier, who attempted suicide by stabbing himself in the left side with a butcher's knife, so that spleen, omentum, and intestines projected. Three days later a surgeon replaced the intestines, and cut away the spleen and omentum. Recovery to perfect health ensued, and the man was known to be alive years afterwards. Various other curious cases of removal of the spleen after knife wounds are referred to in the literature (Spencer, 1920), and it seems probable that in times of war opportunities for the operation would be offered from time to time. It must be remembered, however, that facilities for publishing such cases in print were extremely limited until 100 years ago.

In more recent times there is the well-known case of Spencer Wells (1866), which is probably one of the first English cases in which the abdomen was deliberately opened and the spleen at once removed, but the patient died one week later. With the advent of Listerian principles of surgery splenectomy was soon frequently performed, but at first the death-rate from the operation was high.

STUDIES OF FUNCTION.

We may return now to a consideration of how real knowledge of the structure and functions of the spleen was acquired, after the influence of Galen and his teaching had waned. We may fittingly commence with the observations of the famous Italian anatomist Malpighi (1665), who not only described the lymph follicles but also noted in dogs that the trabeculæ were muscular and capable of contraction. As to function he considered that the organ was essentially a gland, and although it had no ducts he suggested that the large veins and spongy structure of the organ would adequately suffice for glandular excretion. His final conclusions, however, were quite definite: "What therefore is to be thought of this artificial bowel, I am perfectly ignorant." In 1722, William Stukeley gave his Goulstonian lecture to the Royal College of Physicians of London, On the Spleen: Its Description and History, Use and Diseases. The lecture was published for the author in 1723, and is a most beautiful book, illustrated by his own fine drawings. Stukeley's work is remarkable both for its style and for the ideas expressed, some of which, as shall be seen, were far in advance of his own times. Some of his introductory remarks (page 2) are delightful.

> "The uses of the apparatus [i.e., the contents of the abdominal cavity] are by the industry of the Curious pretty manifest, except that of the Spleen; which yet has not fail'd to be a subject of enquiry in all ages, and has rack'd the brains of physicians, as well as the bowels of their patients. . . . But still, what formerly was the seat of joy [here Stukeley follows Pliny] is become a topic of grief to the moderns, since our improvements have presented us with no other than a negative knowledge therein; and in the main we are forc'd to own our ignorance of nature's intention in forming the curious organ of the spleen."

Stukeley's own views of splenic function are, however, set forth with the utmost clearness, and are of great historic interest in view of recent developments in splenic physiology (Barcroft, Binet, and others). He recognised that this spongy organ could, when filled with arterial blood, "at pleasure upon its contraction" empty itself again. He asserted that the organ served to maintain the balance of the circulation, acting as a sort of diverticulum or safety valve to the general systemic circulation. Some of his remarks are for us even nowadays so apt, that he may be allowed briefly to speak for himself in some sentences from page 50 of his book.

> "I take it for granted that in common way of living we make more blood than is just necessary for the occasions of life; and without this provision, we should be subject to a thousand inconveniences."
>
> "She would be a very imprudent and improvident mother, or rather stepmother, that was so niggardly as only to take care of supplies the moment we want it. So complicated a machine, liable to external injuries and internal disorders, must have a reasonable *overplus*, a stock in hand to be employed whenever there is occasion, and for fear a regular supply should be procrastinated."
>
> "Even regular exercise and muscular motion . . . demand a considerable plenitude of juices; and if there was not more than enough, we should be continually fainting."
>
> "Therefore this so necessary a surcharge of blood, I suppose so regulated by the spleen, as that no inconveniences arise from it." . . .

Stukeley's views were supported in the main by Lieutaud (1738, 1742) and Hodgkin (1832).

If Stukeley's book may be regarded as the "classic" on the spleen in the eighteenth century, then the book of Henry Gray, "On the Structure and Use of the Spleen," published in 1854, holds the same position in the next century. He gives a remarkably full historical account, on which I have freely drawn for these lectures, and also a whole series of interesting observations made by himself. He unfortunately failed, in his experiments, to prove the contractile power of the spleen, and so he gives the organ a much more passive rôle as a regulator of blood-supply than did his predecessor Stukeley.

A contemporary of Henry Gray, the comparative anatomist Kölliker (1849), first noticed the disintegration of red blood corpuscles within the cells of the spleen. This fact was soon amply confirmed by other observers and formed, until very recent years, the basis of the sole function attributed to the spleen in subsequent text-books.

Structure of the Spleen.

It has been convenient to describe the early history of our knowledge of splenic function without much reference to structure, since, if we except Malpighi's discovery of the lymph follicles, little was known except the gross anatomy of the spleen, until the rapid development of microscopic and histological technique in the middle of last century.

We may now, however, turn definitely to the problems of splenic structure, and since my object is to lead up to a consideration of the various forms of splenic disease met with in human beings, I shall confine myself to points in structure which may be important in that connexion. Full reviews of the modern development of our knowledge have been given by Tait and Cashin (1925), and by Hueck (1928). It is seen that most of the important papers date from the middle of last century, and that there is scarcely any agreement among them on fundamental points. It is also obvious that in recent times much of the older work, and its possible significance, has been completely forgotten. It has disappeared, at any rate, from all except some of the largest text-books of histology, and generally the descriptions given of the finer histology of the spleen in student's text-books are very poor and meagre. As soon as I began to be interested in diseases of the spleen, I naturally read the best available accounts of splenic histology, but the extreme divergences of opinion was an unexpected obstacle. Since, however, comparative studies of the structure of the liver lobule in different animals had greatly helped me in clusions because of technical difficulties with the small fragile vessels. It seems almost impossible to hope to solve the problem by purely histological methods in the complex spleen of man or the higher animals, and there are still supporters of each of the three hypotheses just mentioned. Help has come, however, from the physiological researches of Barcroft and his colleagues on splenic function, and particularly from experiments in which animals were poisoned with carbon monoxide. In these animals it was found that the blood in the spleen pulp remained free from the poison until the spleen contracted after exercise, when the blood in the pulp immediately contained the gas in the same concentration as that in the general circulation. This at once suggested a form of "two-way" or alternative circulation in the mammalian spleen, part of blood passing straight through and part being diverted into the pulp. What is the mechanism in the spleen by means of which such a double circulation is possible? I believe that Barcroft's work, together with the observations and experiments which I shall now describe, suggest strongly the essential structures involved.

EXPERIMENTAL OBSERVATIONS.

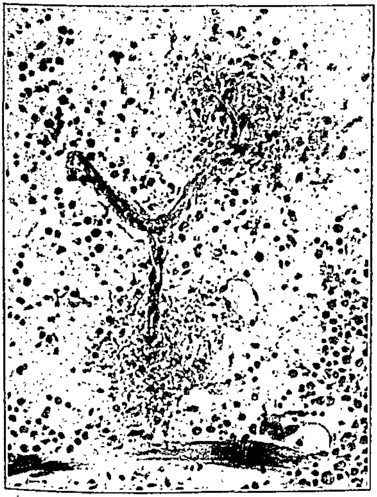
Cashin and I, by direct histological examination in several species of animals, were able to verify the earlier opinion of Whiting (1897), that the small splenic arterioles, after passing through the ellipsoids, open directly into blood-sinuses. We also easily confirmed the fact, as some of the microphotographs show, that channels or potential channels, in some animals lined by endothelium, penetrate the walls of the ellipsoids to end in the pulp. A series of experiments was also carried out in cats, in order to obtain support if possible for the above observations. Yeast-cells were grown in culture to approximately the size of the animals' red corpuscles, and injections of these cells were then made into the splenic artery of the living animal under differing conditions. In the first experiments the spleen, before the termination of the injection, was simply clamped off and fixed immediately by multiple subcapsular injections of formalin. In the second experiments the living spleen was kept firmly contracted by electrical stimulation of the nerves during the whole period of injection before it was clamped off and fixed with formalin. In the first experiments the yeast-cells were easily recognisable, by their different staining reaction from blood-cells, both in the blood-vessels and in the pulp. In the second, the yeast-cells were confined to the blood-vessels and blood sinuses, and absent from the pulp.

Further, in direct observations of the thin edge of a mouse's spleen, examined with a dissecting microscope and very powerful light, erythrocytes could be seen lying stationary in the pulp while blood was pumping freely through the adjacent arterioles into sinuses, and then emerging by the veins.

These simple experiments, together with those of Barcroft, undertaken for quite another purpose originally, seem to very strongly support the view that there is a double type of circulation in the spleen of higher animals and in the human spleen.

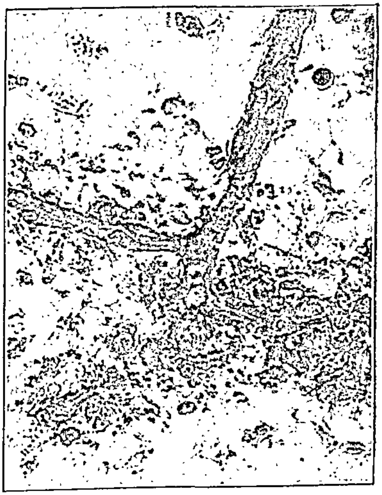
The solution of the problem of the circulation through the spleen is so necessary for the explanation of important forms of splenic disease that I wish to emphasise again some of the most salient points. It seems unlikely, in the first place, with the histological methods at present available, that we can hope

FIG. 4.



Mammalia (*Felis domestica*). Microphotograph of a cat's spleen washed out with saline solution before fixation. Shows two terminal arterioles (penicilli) with an ellipsoid on the end of each (low power). From a section kindly presented by Prof. J. P. Hill.

FIG. 5.



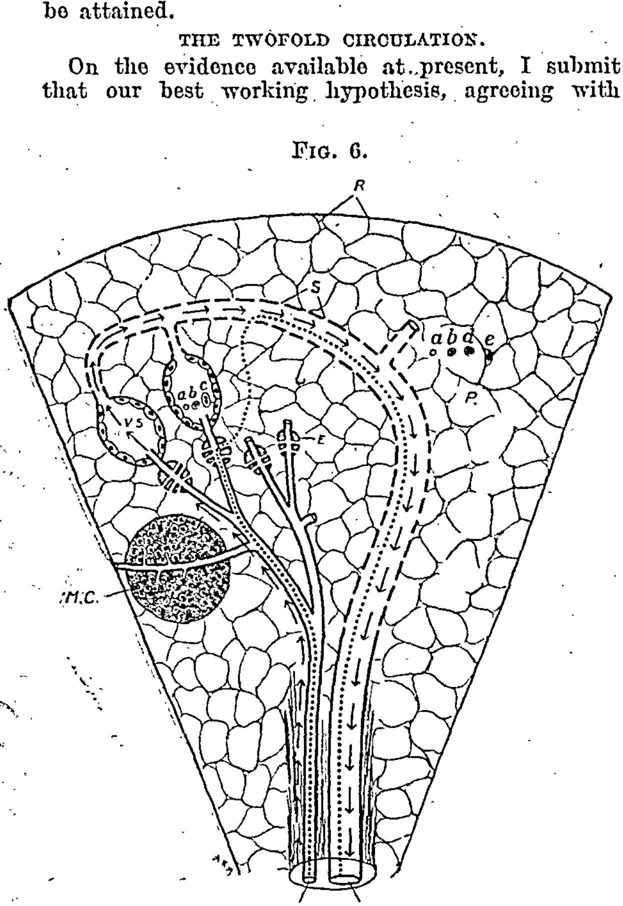
Part of an ellipsoid in a cat's spleen. Shows side channels which in this animal are lined by endothelial cells.

to solve the matter with certainty in the very complex spleens of man and the higher animals. In lower animals, histological methods have been of much service, but chiefly, I believe, because they have shown definite differences in the type of circulation in different animals—open in fishes, and closed in some reptiles. This, as I have stated, may serve to explain the great divergences of opinion regarding the splenic circulation expressed by different histologists during many years. It is only by experiments, and advances on those which have just been described, that a complete answer to our problem may finally be attained.

THE TWOFOLD CIRCULATION.

On the evidence available at present, I submit that our best working hypothesis, agreeing with many observed facts, is to regard the circulation through the human spleen as twofold. The first, or ordinary circulation going on continually, is a direct one, the blood being pumped through the splenic artery into venous sinuses, and from thence passing directly into the veins. The second circulation is intermittent, brought about by contraction and relaxation of the whole organ, and consists of an emptying of the pulp spaces through the wide stigmata into the veins and a filling again through the lateral channels in the walls of the ellipsoids. It seems probable enough, since minor alterations in the volume of the spleen are constantly taking place, that a small amount of blood is constantly being drawn out from the pulp into the veins to join the direct flow through the spleen; but the admixture of blood from the venous sinuses and from the pulp can, on this view, never be great unless the whole organ has undergone definite contraction.

FIG. 6.



Diagrammatic representation of a splenic lobule. The succession of arrows indicate closed splenic circulation, while the interrupted line shows open splenic circulation, through the pulp. *M.C.*, Malpighian corpuscle; *E*, ellipsoid; *V.S.*, venous sinus; *P*, splenic pulp; *R*, reticulum; *S*, stigmata in wall of vein. (*a*) Red blood corpuscle; (*b*) leucocyte; (*c*) endothelial cell from wall of blood-sinus; (*d*) lymphocyte; (*e*) multipolar cell of pulp.

The ellipsoids are certainly one of the most remarkable structures belonging to the whole vascular system, and there is nothing comparable to them in any other organ. Our knowledge of them has come almost entirely from the spleens of lower animals, since in the highly complex human spleen accurate study by histological methods is practically impossible. Tait and Cashin emphasised the important fact that the ellipsoids can act as potential valves, preventing any reflux of venous blood into the arterial system, and it is easy to realise how important this function may be when the spleen is contracting to empty the pulp. They are, in fact, the only valves or potential valves of the whole splenic vascular system, and it will be remembered that there are no valves in the main splenic vein or even in the portal vein. It is thus easy to see how, in conditions of increased portal venous pressure, the first obstruction, so far as the spleen is concerned, is at the ellipsoids. This is probably the deciding factor in reference to a characteristic lesion, the so-called "siderotic nodule," which is met with in a number of types of splenic disease.

It is well known since the experiments of Warthin, confirmed by Kellaway and myself (unpublished) that ligature of all the splenic veins, even when this is repeated at intervals in the same animal to occlude all newly formed anastomotic channels, does not lead to permanent splenic enlargement, but only to temporary acute swelling, followed ultimately by complete splenic atrophy. It is obvious that such experimental occlusion of the splenic veins is not strictly comparable with that caused by pathological thrombosis. Nevertheless, it is difficult to believe that complete obstruction of the splenic or portal veins, found in some cases of splenomegaly, can be the cause of the enlargement unless accompanied by independent pathological changes within the spleen itself. Experimental thrombosis of the splenic vein in one cat has been produced by a sclerosing solution of quinine and urethane (McMichael, 1931), but without resulting in splenomegaly.

Nerve-supply.

I shall have more to say about the general nervous control of the spleen in my next lecture. Here it is sufficient to state that the synapses of the autonomic nerves appear to be in the cœliac ganglion, and branches accompany the arterial supply to the spleen. Electrical stimulation of a nerve twig accompanying an arterial branch causes a striking segmental contraction, and the segments supplied by different branches do not overlap (Tait and Cashin). For the present the nervous control, except that which may be involved in the mechanism of generalised contraction of the organ, is of no known practical importance in disease.

Weight.

In concluding this lecture, a word or two may be said about the weight of the normal spleen, in animals and in man.

In vertebrates the spleen in comparison with the body-weight varies enormously, its relative weight being greatest in the fishes and least in the birds. In man many observations on the weight of the normal spleen at different ages were made by Henry Gray (1854), and he believed that the organ should be largest when most active in functional activity. In a series of 160 spleens he noted that the organ is largest during youth and active adult life (average weight 6–7 oz. in the adult), but that in old age the weight, both actual and relative to body-weight, decreases, until in those over 60 years of age the average is only 4½ oz.

The same question has recently been studied by *Gross* (1918–19), who has added many additional points of interest. He concludes that the spleen is heaviest and has its period of greatest functional activity early in life, and that by the age of 40 the functional activity of the organ has greatly declined. He maintains, moreover, that the histological changes which occur in the spleen with age have a most important bearing on the reactions of the organ to disease, and that middle life is the time when the organ shows its greatest reaction to irritants, using the word in the *broadest* sense.

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REBUILDING OF CORBETT HOSPITAL.—It has been decided to rebuild Corbett Hospital, Stourbridge, in sections, and the first unit, on a site a short distance from the present buildings, is to be erected at once. The new block will have accommodation for 18 adults and 10 children and the cost will be £24,000, the greater part of which is already available.

NON-OPERATIVE TREATMENT OF THE SENILE PROSTATE.

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THE changes in the prostate in the later years of life may be considered analogous to the climacteric changes in the female generative organs, and it appears somewhat of a slur on our profession that most medical practitioners have but one of two alternatives to offer to patients consulting them for the symptoms associated with senile prostate: either the horrors and risk of a catheter life, or the more serious procedure of surgical operation. The object of this communication is to draw attention to the treatment of the senile prostate by deep X ray therapy, or by diathermy plus static wave, or a combination of the two.

We fully recognise the wonderful results of prostatectomy in a large number of these patients, and we consider that, at the present day, it is indubitably the indicated treatment in a certain type of case. At the same time it is well recognised that operation often only gives partial relief, while in some instances complications or shock leave the sufferer even worse than he was before. The operation is far from being free of risk to life. The age of the patient is itself a source of danger. Sir John Thomson-Walker, in last year's Lettsomian lectures,[1] gives the mortality from 11 great general hospitals in different parts of the country from 1918–28 as 19·5, and in his own private practice as 6 per cent.

Ætiology of Prostatic Enlargement.

Kenneth Walker writes[2]: "All that can be said with certainty is that every cause that has yet been suggested is either definitely wrong or else insufficient alone to explain the facts."

There are two distinct types of simple senile prostate: the large elastic or soft, and the small hard. The problem requiring solution is whether these are completely separate conditions, or whether there is always a preliminary increase in the adenomatous elements with subsequent replacement of the glandular portion by fibrous tissue. The microscopic changes are very similar to those which occur in the female breast at the menopause—distension of the alveoli, tendency to develop intra-acinous growths as the result of epithelial proliferation, patchy distribution of these changes, and absence of round-celled infiltration. Whatever the origin may be, simple enlargement of the prostate resembles, in its gross and histological characters, an adenoma with a varying amount of cystic formation. It is therefore justifiable to assume that the soft hypertrophied prostate is definitely adenomatous and characterised by the new formation of epithelial cells. The absence of any round-celled infiltration would tend to disprove the contention of Chiechanowsky that inflammation is the primary cause of all senile prostates.

The explanation of the fibrous prostate, however, offers greater difficulties, and we venture to put forward the hypothesis that this form is the result of inflammation which may occur in two distinct ways. Firstly, an adenomatous condition may start in the prostate, resulting in a dilatation of the ducts of the peri-urethral glands whereby sepsis may invade the prostate from the urethra. A hyperplasia ensues, followed by the usual overgrowth of connective tissue and a final obliteration thereby of the glandular tissue, the end-result being that the gland becomes more or less a complete mass of fibrous tissue. On the other hand, excessive fibrous tissue may result from the irritation of chronic prostatitis brought about by causes such as excessive riding or bicycling, masturbation or sexual excess, or chronic gonorrhœa or other infection. Such a hypothesis as this is but a development of Ciechanowsky's theory, and puts aside the suggestion of Lannois that the condition is a degenerative fibrosis due to arterio-sclerosis—an explanation that is not accepted by such authorities as Thomson-Walker, Kenneth Walker, and Caspar, and Motz.

The symptoms are so well known that it is not necessary to enlarge on them, except to say that the early symptom of frequency is almost certainly due to nerve irritation associated with a hyperplasia of of the lining epithelium of the prostatic urethra and internal sphincter of the bladder, analogous with the symptoms of congestion of the mucous membrane over a deflected nasal septum. This explains why a large prostate may give rise to no symptoms and why, on the other hand, there may be definite urinary symptoms with little tumour formation (J. Lazarus [3]).

Principles of Non-operative Treatment.

The treatment of senile prostate by deep X rays, in combination with diathermy and static wave applications, is based on the following principles, which are well recognised.

(1) The selective action of rays of short wave-length in destroying newly formed cells and leucocytes.

(2) The effect of diathermy in promoting increased circulation in the part treated.

(3) The action of the Morton wave current in causing cellular contraction (histological massage) and thus aiding the increased circulation to get rid of the debris of the cells destroyed by the X rays.

It is remarkable that, whereas the medical literature of France, Germany, and America teems with articles from well-known workers approving radiotherapy for the senile prostate, hardly a reference can be found to it in the literature of our own country, except in two papers by Mr. T. E. Hammond [4] and Dr. Howard Humphris.[5]

It would be impossible to epitomise all the articles recently written on this subject, but a few are significant.

Boit [6] (1928) describes 58 cases (12 in the first stage, 13 in the second stage, 33 in the third stage), of whom 48 showed normal function of the bladder after X ray treatment. After two and a half years he traced 24 cases, all of whom remained cured. He considers radiation the method of choice for cases in the first stage, and both he and Hinze advocate it for old people.

Guilbert (Paris) reports 43 cases with 34 cures, one relapse, and five subsequent operations.

Joachim Fürstenau [7] describes his experiences at length. He discusses 59 cases (13 between 69 and 70; 27 between 70 and 80; 17 between 80 and 90; and two between 90 and 100), going in great detail into the condition of each, and states that 55 were cured or immensely relieved by irradiation.

Devois [8] writes of his favourable results and says that the treatment is especially indicated in cases where there are emphysema, chronic bronchitis, valvular or myocardial troubles, high arterial tension, diabetes, hæmophilia or old age, or where operation is refused by patient or relatives.

Guyon is equally enthusiastic, as are Thomas and Giles,[9] Pilger,[10] and Lazarus.

Ledoux-Lebard [11] (1924) critically examines the treatment and says that, though it is possible to get some relief by using the rays from ordinary X ray apparatus, immeasurably better results are obtained from a tube passing very hard rays (200 k.v.). With apparatus which will only pass currents not exceeding 130 k.v., the extra time of exposure required and the comparative thinness of the filter introduces an element of risk of damage to the intervening tissues and, owing to the rays not being sufficiently hard, an adequate dose does not reach the prostate. He issues the warning that at first symptoms may be increased from congestion, but that these can be overcome and then relief is obtained. He urges the wisdom of repeating the treatment at intervals.

In addition to the above we have found over 20 articles on the subject in foreign literature, couched in the same favourable language.

REASONS FOR NEGLECT OF RADIOTHERAPY.

We cannot but feel that the unfavourable light in which many genito-urinary specialists in this country view the treatment is due first to faulty technique, secondly to insufficient care in selecting suitable cases, and thirdly to a misconception as to certain effects which may follow the treatment but which, though *post*, are not necessarily *propter hoc*.

(*a*) Some surgeons have stated that X ray therapy makes a subsequent prostatectomy more difficult owing to fibrosis. Kenneth Walker, though writing unfavourably of the treatment (after an experience with X rays in five cases only), states: "It does not interfere with enucleation should this become necessary." This view is borne out by all foreign authorities, and Sir James Berry informs us that he has not found that radiotherapy increases the difficulty of subsequent operation for exophthalmic goitre. He further agrees with us that, when an operation was difficult owing to fibrosis, the fibrosis was a factor of the disease and not the result of antecedent X rays.

(*b*) Retention has occurred immediately after treatment. This is due to a temporary congestion that frequently takes place after adequate X ray dosage and, though catheterisation may be necessary for a few days, benefit is usually noticed as soon as the congestion subsides.

(*c*) Rectal ulceration, or other X ray damage, is just as much a fault of overdosage as in any other part of the body and, except in an extraordinarily radio-sensitive patient, ought not to occur.

(*d*) The possibility of damaging the skin at the site where an incision would be made in a subsequent prostatectomy is fully discussed under the heading of technique, and can easily be avoided.

(*e*) A much more difficult question to decide is whether or not to remove all senile prostates, considering that it is stated that 16 per cent. of glands removed for simple enlargement have been found to show malignant changes. Now the mortality from prostatectomy is so high that the risk of operation would seem to balance the danger of malignancy. On the other hand, we have in X ray therapy a form of treatment without risk and one which will be beneficial even if cancerous cells are already present. We cannot but feel, therefore, that in cases where examination does not give rise to any suspicion of the presence of malignancy and where other factors indicate that radiotherapy can be employed with reasonable anticipation of success, it is right to recommend such treatment. The possibility of latent early malignancy is another strong argument for the use of the most deeply penetrating rays.

Indications and Technique.

The treatment is indicated for all early cases, and for later cases when there is no large amount of residual urine (i.e., exceeding 2–3 oz.) and no definite enlargement of the gland into the bladder, as shown by cystoscopy. These signs, as well as evidence of back pressure on the kidney and the presence of cystitis, are contra-indications. Joachim Fürstenau, of Königsberg, employs radiation even where there is cystitis, after washing out the bladder for a time and administering urotropin.

Where benefit results from treatment it is important that the patient should have a further series if the symptoms return (which they not infrequently do, as the condition is progressive). It is quite possible to keep them in abeyance almost indefinitely by this treatment.

The present method is to work at 200 k.v. (kilovolts) and to attack the gland through the perineum, two inguinal fields and two fields on either side of the coccyx, making five fields in all. Four-fifths only of the unit skin dose is given to the perineum, the skin in this region being usually moist and rather liable to damage by the rays; the full dose is given to the other four fields. Recognising the risk of damaging the skin for subsequent operation we protect a central strip of the abdomen, 3 in. wide, from the symphysis to the umbilicus, and only direct the ray through the inguinal regions. For access to the perineum we seat the patient on a special stool, similar to an office stool in form and height, a chair placed in front of it serving as a foot-rest. This special stool has an aperture about 10″ × 6″ cut in the seat and the X ray tube is placed beneath the seat, the compressor pointing upwards through the opening. The top of the stool, excepting for the aperture, is completely covered with lead rubber, while a piece of the same material hangs down in front to protect the patient's legs. The advantages of this method are obvious: the buttocks are held widely separated, permitting ready access to the perineum; the patient is comfortably seated instead of lying in the lithotomy position; and there is no possibility of sparking from the ends of the tube into the patient. A filter of ½ mm. zinc—4 mm. aluminium and a focal surface distance of 30 cm. are used.

In treating the lateral fields we use a modification of the method devised by Chaoul which entails the use of two special pieces of apparatus.

The first consists of a wooden box, 15″ × 15″ × 12″, the lid of which carries a fluorescent screen, action side facing inwards. The side of the box is open and a mirror is fitted in it at an angle of 45°, so that the image of the fluorescent screen can be easily seen through the open side. The second requirement is a lead ball about ¼ in. diameter which is soldered on to a piece of stiff copper wire about 6 in. long. The room is darkened and the following procedure is carried out, using the minimum amount of artificial light. With the patient lying on his side the lead ball is inserted into the rectum to such a distance that it comes in contact with the prostate. The patient then turns on his back and the tube is centred over Poupart's ligament, being inclined so as to direct the rays slightly inwards. The Chaoul box is then placed under the couch directly beneath the prostate area, and a small current is passed through the tube. All lights are now extinguished, and the operator, lying on his side, looks into the Chaoul box, where he can see the map of the fluorescent screen illuminated by the rays. Wearing a lead rubber glove to protect his hand, he moves the carrier until the shadow of the lead ball appears in the centre of the field, when the central ray will be passing through the prostate gland. This aim is greatly facilitated by the use of a flat diaphragm of thick lead with a central opening 1 in. in diameter, which is slipped inside the compressor ordinarily used for treatment. A small circular field of illumination is thereby obtained, making the localisation more exact, and the shadow of the lead ball more clearly visible. This adjustment having been effected (and it should only take a minute or so), the compressor is brought down on to the patient, using as much pressure as can be tolerated. The lead diaphragm and ball are then removed and the treatment given. Care must be taken not to forget to remove the lead ball, as it would form a centre of strong secondary radiation which might easily lead to ulceration of the rectum. This method is employed in the treatment of both inguinal and coccygeal fields. In both cases a filter of ¼ mm. zinc—3 mm. aluminium is used. The front is treated at 30 cm. focal surface distance, and the back at either 23 cm. or 30 cm. focal surface distance, according to the thickness of the patient.

The supplementary diathermy and static applications begin as soon as the radiotherapy is completed and are given daily or on alternate days over a period of three weeks. For the diathermy we use a rectal electrode similar to that devised by Cumberbatch, while the other electrode is placed just above the symphysis and over the area of skin which was protected during the radiotherapy, the skin which has been subjected to the rays being thereby avoided. For the static wave applications it is necessary to use a machine capable of generating a satisfactory charge at slow rotation, and it is important to treat with slow impulses using the maximum length of spark obtainable.

In cases where the prostate is small and hard it is often sufficient to use only the combination of diathermy and static wave, as radiotherapy has but little effect on the purely fibrous prostate.

The general results that we have obtained in the treatment of simple senile prostate have been so encouraging that we have summarised the 16 cases that we have had the opportunity of treating. While it may be said that the number is small—and it is indeed so in comparison with those of some of our Continental colleagues—we bring them forward in the hope that some serious attention may thereby be drawn to this form of treatment, and also that some of our own colleagues may be persuaded to enter the lists and give their experiences of the treatment of the condition by X rays and other electrical methods.

Cases.

Case 1.—Age 72. Very large elastic prostate with early symptoms of retention and residual urine about 5 oz. Frequency two-hourly day and night. State of heart contra-indicated operation. Both frequency and retention much improved for five months subsequent to treatment; then, following a motor accident, the patient's nerves were much shaken and the symptoms were aggravated. A further course of X ray, diathermy, and static wave were given and he improved for eight months; then, the retention getting worse, he was operated on with complete success. The surgeon said that there was no evidence to suggest that the radiotherapy had caused *fibrosis. Although a successful* result was in this case doubtful from the start, owing to the retention and large quantity of residual urine with almost certainly a large middle lobe, the patient wished to try anything rather than be operated on—a view in which the surgeon concurred.

Case 2.—Age 77. Large medium-hard prostate. Frequency two-hourly at night, four to five times during the day. Was catheterised every week. After treatment much improved. Frequency twice at night. A year later he reported that improvement was maintained unless he did horse-riding. He has now left the neighbourhood and we cannot trace him, but 18 months ago—i.e., four years after treatment—we learned that he was going on well and that his general health was excellent.

Case 3.—Age 65. Large elastic prostate, no evidence of retention. Residual urine about 2 oz. Day and night frequency. He was treated in 1924. This year he writes: "I have never ceased to be thankful that I underwent the treatment instead of operation. I generally go through the night without being disturbed." His general health is much improved.

Case 4.—Age 78. Large hard prostate. Evidence of commencing retention and some residual urine. Frequency five times at night and two-hourly by day. Had monthly catheterisation. Two years after treatment his doctor reported that on the rare occasion when he passed a catheter it went in quite easily, whereas previously there had been great difficulty, and that the frequency was now only twice a night and the patient could hold water for three and a half to four hours by day. Shortly after this report he died of heart trouble.

Case 5.—Age 60½. Increased frequency by day and night with difficulty in starting. Prostate large, smooth, and elastic. In 1928 (four years after treatment) patient came to report that he had been much better but that he thought symptoms were returning. Treatment was repeated and benefit has lasted till now.

CASE 6.—Age 67. Frequency three to four times at night, two-hourly by day. Some pain. Prostate not much enlarged; smooth, flat, rather hard. Treated in 1927. Reports in 1930 that the day and night frequency is much less and the improvement is maintained, and adds, "I have derived very great benefit from the treatment."

CASE 7.—Age 69. Prostate rather hard, not enlarged. Frequency three times at night and about six times during day. Occasional slight hæmorrhages. Treatment in 1925. He now reports that he has been much better since and that, although on some days he passes more water than on others, there is no discomfort or inconvenience. He hunts regularly.

CASE 8.—Age 67. Had several attacks of hæmaturia. Prostate enlarged and soft. Neither X ray nor cystoscopic examination revealed the cause of the bleeding. No *B. coli.* Slight frequency, though not very marked. Treated 1928. From then up to last June there was no bleeding, and the patient writes: "There was no doubt as regards frequency that this trouble was lessened after the treatment." Since June he has been again cystoscoped, and there are fears that the cause is malignant disease of the bladder.

CASE 9.—Age 78. Prostate very large, smooth, elastic. Frequency three or four times at night, very often in the day. Residual urine 2½ oz. Treated 1928. After a year he reported: "Can sleep all night without being disturbed. Much less frequent by day. Feeling very well." This improvement is still maintained.

CASE 10.—Age 72. Prostate large and soft. Residual urine 2 oz. Day and night frequency marked. Treated April, 1928. Immediately after the treatment the frequency increased. Various means were tried, but in June he got acute retention; cystotomy and subsequent prostatectomy were necessary. It is very difficult to trace the relation between the treatment and subsequent events, for the retention in June could not have been due to prostatic congestion from the radiation, as the interval of time was too long. It was the breaking-down of the wound after operation in this case that made us abandon the suprapubic route in raying the gland.

CASE 11.—Age 72. Prostate enlarged, elastic. Some day and night frequency. Treated May, 1929. We heard that he was relieved and in much better health after the treatment.

CASE 12.—Age 61. Prostate rather small and hard. Frequency about three times at night. Treated May, 1929. Reports that he now gets up twice instead of three times at night, but otherwise not improved.

CASE 13.—Age 79. Prostate rather small, hard, smooth, not tender. Frequency four to five times at night. Every two hours by day. Pain and difficulty in starting. Treated June, 1929. In October, 1929, reported "infinitely better in every way." Now there is no pain or discomfort and flow starts much more easily. Frequency is less, and general health is excellent.

CASE 14.—Age 78. Prostate enlarged. Frequency three times at night and very often during the day. Heart and lung condition contra-indicated an operation. Treated February, 1929, but died in October from pyelonephritis and uræmia. His son, a medical man, wrote: "He certainly had been more comfortable since the treatment and only had to be catheterised at long intervals."

CASE 15.—Age 78. Prostate large, hard, smooth. Difficulty for some years. Frequency seven to ten times at night and one and a half to two hours by day. No X ray evidence of stone. Treated by diathermy and static wave only in April, 1930. After 12 treatments flow started easily. Frequency was only once or twice at night, and he could go three hours during the day. This month he reported that there is no relapse and he can shoot two or three days a week.

CASE 16.—Age 79. Pain and difficulty on micturition for 12 months. Frequency six to seven times at night and two-hourly by day. Treated by diathermy and static alone in June, 1930. Writes this month: "I am considerably better, nights much freer from trouble, and I am feeling more like I was a year ago before the prostatic trouble began. If I should relapse I shall call on you once more for your help."

Summary.

1. Surgical interference is called for in all cases of senile prostate where there is much residual urine, definite enlargement into the bladder as proved by cystoscopic examination, cystitis, or evidence of back pressure affecting the kidney.

2. Where the above conditions are not present, deep radiotherapy with or without diathermy and static wave is to be employed. In cases of small hard fibrous prostate the last two forms of treatment alone often give the best results. The non-surgical methods are also indicated: (*a*) in early cases; (*b*) where the heart, lung or general condition, or age of the patient, contra-indicates operation; (*c*) where the patient or his friends are unwilling for surgical interference unless absolutely necessary.

Where relief has been obtained it is important that the patient be kept under regular periodic observation; for the condition is a progressive one, the symptoms may recur, and further application may be necessary to keep the progress of the malady in check.

No mention has been made of ultra-violet therapy or prostatic massage, since the treatment described above is regarded by us as infinitely superior.

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CAVERNOUS SINUS THROMBOSIS:

A FATAL COMPLICATION OF MINOR FACIAL SEPSIS.

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THE present series of six cases of cavernous sinus thrombosis is collected from the records of St. Bartholomew's Hospital for the period 1922 to 1930. Three of the cases are described at some length, though only one case came under my direct care. This condition was first described from post-mortem findings by Abercrombie (1818) and Duncan (1821). The first clinical record was made by Vigla (1839). The differential diagnosis was discussed by Knapp in 1868, while Dwight and Germain (1902) were the first to attempt surgical treatment. Up to the present about 350 cases have been recorded, and in a series of 140 cases collected by Dorland Smith (1918) 35 per cent. were due to infection of the face or orbit with a spread to the cavernous sinus through the ophthalmic veins. A further 40 per cent. were secondary to ear infections, 13 per cent. to infections of the mouth and throat, 9 per cent. to the nose, and 32 per cent. to other causes. Only cases falling into the first group are discussed in this paper.

Anatomy.

The anatomy and the connexions of the cavernous sinus are a matter of the first importance in understanding the pathology, symptomatology, and treatment of this condition. Roughly quadrilateral in shape, tapering from behind forward and about 2 cm. in length, the cavernous sinus is situated on each side of the body of the sphenoid and extends from the sphenoidal fissure in front to the apex of the petrous portion of the temporal bone behind. Above and to the outer side is the temporosphenoidal lobe, while the optic tract, the crus, and the pons are superior relations. In the adult the cavernous sinus is only separated from the sphenoidal air sinus by a thin plate of bone. The sinus is trabeculated and contains the carotid artery and the sixth nerve, which lie on its internal aspect against the wall of the sphenoidal air sinus. The third, fourth, and fifth nerves run forward to the sphenoidal fissure in the external wall.

The cavernous sinus on each side receives blood from the middle cerebral veins, the sphenoparietal sinus, the veins from the sphenoidal air sinus, and from the superior and inferior ophthalmic veins. A communicating vein joins the superior ophthalmic to the angular vein, which is often of considerable size. The angular vein is formed by the junction of the supra-orbital and frontal veins and is continued down the side of the nose as the anterior facial vein, which is joined by many small tributaries from the subcutaneous venous plexus on the side of the nose. Other connexions of the cavernous sinus are mainly efferent channels, though this by no means precludes these channels as routes of spread of thrombosis. The superior and inferior petrosal sinuses pass from the cavernous to the lateral sinus, and emissary veins pass through the base of the skull to join the pterygoid venous plexus, which provides an indirect communication between the cavernous sinus and the soft palate, fauces, and pharynx, and the alveolar processes of the upper and lower jaws. The circular sinus connects the cavernous sinus to that of the opposite side.

In the cases under consideration the connexions which carried the infection are those from the face, and particularly from the nose and upper lip, by way of the subcutaneous plexus and the angular and ophthalmic veins. Logan Turner (1926) demonstrated by a series of sections through the nose, orbit, and the base of the skull that the spread from the nose to the cavernous sinus took place by this route; this was confirmed in the present series by a dissection of the veins in Case 1, sections being taken at intervals to confirm the thrombosis, which could be seen macroscopically.

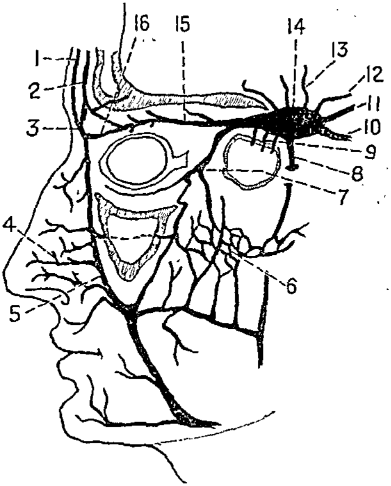
Pathology.

The process of thrombosis in a vein or a venous sinus depends upon three factors: degenerative change in the vessel wall, sluggishness of the blood stream, and pathological changes in the blood. These factors are intimately related, though in various conditions one may stand out above the rest. Thus slowing of the blood stream and impaired vitality of the vessel endothelium are of chief importance in the formation of a simple thrombus, whereas in the infective variety it is the organisms or toxins in the blood which are the determining factors in the thrombosis.

The spread of infection from the septic focus to the sinus may take place in three ways. Firstly, a clot may form in a vein near to the focus; infection follows, giving rise to a further spread of thrombosis. Secondly, there may be a diffusion of toxins along the perivascular lymphatics, with a transmural spread to the endothelium of a vein or sinus. Lastly, a particle of a thrombus which has reached a tributary may be dislodged and carried to the sinus as an embolus. However the clot forms, it eventually becomes infected and pus is formed which, if carried into the general blood stream, gives rise to pyæmic abscesses in the various organs of the body.

From the material collected in this series of cases it is impossible to say by which method the infection spread, but from the dissection of the veins of the nose and orbit in one case (Case 1) it was obvious that the process was one of direct spread by the lumen of the vein or by the lymphatics, as in all the areas involved the veins contained blood-clot or pus which was continuous from the *angular* vein to the cavernous sinus. Further, *in Case 2*, the vessels in the meninges showed the spread of infection taking place by the perivascular lymphatics. Sections made from the less damaged *inferior* ophthalmic veins showed a marked perivascular infiltration by *polymorphonuclear* cells and organisms. The latter could be seen *in the* endothelium of the veins, and a few in the lumen. In Cases 1 and 2 a similar condition could be made out in the cerebral veins which were in close relation to the cavernous sinus. This suggests that the method of spread in venous thrombosis is lymphatic diffusion of the toxins, but the fact could only be demonstrated by obtaining from a case a series of sections which would show a point reached where there would be either perivascular inflammation but no endothelial change, or endothelial damage and thrombosis which had outstripped the perivascular spread.

FIG. 1.



Venous connexions of the cavernous sinus. (1) Frontal vein; (2) supra-orbital vein; (3) angular vein; (4) nasal vein; (5) anterior facial vein; (6) pterygoid venous plexus; (7) inferior ophthalmic vein; (8) vein of Vesalius (inconstant); (9) veins from sphenoidal air sinus; (10) inferior petrosal sinus; (11) superior petrosal sinus; (12) sphenoparietal sinus; (13) middle cerebral sinus; (14) cavernous sinus; (15) superior ophthalmic veins; (16) communicating vein.

Any of the areas drained by the cavernous sinus may be the site of infection giving rise to a septic thrombosis. Infection may spread from the middle ear by way of the lateral sinus, from the sphenoidal and ethmoidal air cells, from the mouth, tonsils and teeth, from osteomyelitis of the diploë and, as in the cases at present under consideration, from minor sepsis on the face.

In the six collected cases, the primary focus was a nasal furuncle in two, an infected insect bite on the nose in one, an infected cut on the nose from a stone chip in one, and a carbuncle on the upper lip in two cases. In three cases the nature of the infection was investigated and found to be staphylococcal, as would be expected. In each of the six cases the body reacted to the local bacterial irritation by the usual processes of inflammation. The failure on the part of the protective mechanism to shut off the infection completely may have been due to several factors. Poor resistance on the part of the patient would favour a spread of infection, but was not present in all the cases. The virulence of the organism is an important factor. The absence of valves in the angular and ophthalmic veins and the large size of the angular vein makes the route easy for spread to take place. It is noticeable that the cases of severe open lacerations of the face and nose, in which there is a mixed infection of staphylococci, streptococci and other virulent organisms, are not complicated by cavernous thrombosis; it is the furuncle or its counterpart—usually small and often staphylococcal—which appears to favour this serious complication. The difference in the conditions seems to lie in the diffusion of toxins at considerable pressure from the abscess cavity, when such pressure has not been relieved by adequate drainage. The fact that the results of incision appear to favour the spread of thrombosis is discussed below.

Once thrombosis of the blood in the sinus has taken place, the spread of the infection with pus formation rapidly follows, and the recovery of the organisms from the circulating blood or even from the urine is an indication of the pyæmia resulting from a failure to shut off the infection in the vein. This is confirmed at post mortem by evidence of pyæmia as shown by pyæmic abscesses, which are eventually present in many organs in all cases which survive long enough. The presence of organisms in the cerebro-spinal fluid indicates the direct spread to the meninges.

Signs and Symptoms.

The first symptoms suggesting a serious complication of a small infective focus on the face are malaise and headache. Case 1 was a child who had been stung on the nose by an insect, and the doctor was consulted because of the headache. An incision was made, but she still complained of severe headache which became steadily worse. Case 2, a railwayman, who had been injured on the nose by a splinter of stone, complained two days later of a " septic place " and headache. He came to hospital next day because he was alarmed about the frontal headache, which had become more severe. He died 48 hours later. The headache is usually frontal, but may radiate to the occiput or be situated over the mastoid process.

Pyrexia is a constant feature. In three of the cases a temperature of 100–101° was noted by the doctor, and in all cases 101–106° was recorded in hospital. The pulse-rate is often not very much raised to begin with, but later usually rises to 120. The white blood count is raised, and increases as the invasion progresses. If the white count falls the prognosis becomes very grave, as this indicates a failing resistance.

Vomiting and rigors are by no means constant, and in only one case was vomiting an early symptom. Rigors occurred in one case at an early stage, but both symptoms were present in the advanced stages in association with a general pyæmia. Drowsiness was present in two cases as an early symptom, but was accompanied by restlessness or delirium at night.

The most important local signs are found in the eye. Orbital cellulitis is one of the first to be seen, but does not give definite evidence of intracranial disease, as it may be due to a spreading cellulitis in the soft tissues around the septic focus. Marked conjunctival œdema is more suggestive, whereas proptosis and chemosis are definite indications of a retro-orbital thrombosis. Corneal ulceration and any internal or external ophthalmoplegia are due to interference with the fifth or with the third, fourth, and sixth nerves in relation to the sinus and, if found accompanying the other symptoms make a diagnosis of cavernous sinus thrombosis certain. It is interesting to note that the earliest paresis is often of the external rectus, due to the position of the sixth nerve within the sinus. Papillœdema may be found, though it is often impossible to see the retina because of the difficulty of looking through a misty cornea. The patient usually dies before papillœdema develops, but an examination should always be made, as venous congestion, thrombosis, or hæmorrhages may be seen. The pupil is at first small but later is fixed and dilated. Vision often fails early, owing to the pressure on the eyeball or stretching of the optic nerve.

Later signs and symptoms are in the main those of the complications. Accompanying a spread of infection to the lateral sinus is an increased probability of rigors, with pain behind the ears and tenderness along the line of the deep cervical glands. Signs of inflammation seated deeply in the neck may be due to a spread of thrombosis to the internal jugular vein, to perivascular inflammation, or even suppuration in the carotid sheath (see Case 1). Meningitis is almost invariably present as a terminal event and was found in the four cases on which a post-mortem examination was performed. Pyæmia was observed in two cases though it was only recognised clinically in one case.

The cerebro-spinal fluid is found to be under pressure and opalescent, with a diminished sugar content. It contains many polymorphonuclear leucocytes and cultures yield staphylococci.

Differential Diagnosis.

The diagnosis of cavernous sinus thrombosis does not usually present any difficulty when once the condition is established. In the early stage the severe headache, and later the proptosis and chemosis, are a guide. The following conditions may present difficulty in diagnosis.

Orbital cellulitis occurs as a complication of infections of the nose and upper lip and may be followed by thrombosis of the sinus. The signs of swelling of the lids, redness, conjunctival œdema, and conjunctivitis are common to both conditions, but proptosis does not occur until the sinus is involved.

Meningitis rapidly complicates sinus thrombosis and may largely overshadow its signs, but the condition of the orbit and eyes differs from any primary meningitis.

Sphenoidal sinusitis may simulate sinus thrombosis very closely, and in one case seen recently there was headache, a raised temperature and pulse, and œdema of both eyelids, and on the second day proptosis of the right eye. The condition cleared up completely after exploration and drainage of the sphenoidal and ethmoidal cells. It is obviously of the greatest importance to decide between these two conditions, and the sinusitis can only be diagnosed by careful examination of the nose assisted by transillumination, radiography, and if any doubt still exists by exploration of the sinuses.

Pulsating exophthalmos is said to be caused by thrombosis of the cavernous sinus. It must be a very rare sign, and if it does occur the other causes need not be considered, as they are all chronic or non-infective conditions.

Treatment and Prognosis.

Septic thrombosis of the cavernous sinus is invariably fatal unless the actual sinus is drained. Bircher (1893) reported one case which he drained successfully by boring through the petrous portion of the temporal bone. The importance of early diagnosis and focal treatment becomes obvious, owing to the lack of success of radical treatment, in spite of many attempts by many different routes. Once the sinus contains an infected thrombus, however, drainage gives the only hope of recovery. There are several possible routes of approach.

First, there is the Hartley-Krause Gasserian ganglion route, of which the most obvious disadvantages seem to be the risk of meningitis if it does not already exist and the fact that the sinus has to be incised in the wall that contains the important structures. Attack through the orbit is possible but only at the sacrifice of structures in the sphenoidal fissure, so that this method would be of use chiefly in cases in which the orbit was the primary focus. Approach through the petrous bone, though giving the only reported success and showing that recovery may be effected by bold treatment, is an extremely severe operation and leaves the patient deaf and with a facial paralysis. A nasal approach, through the wall of the sphenoidal air sinus, described independently by Luc in France and Grunert in Germany, offers the greatest likelihood of success. The sphenoidal air sinus can be drained comparatively easily, and through the superolateral wall the cavernous sinus can be reached without great risk of injury to important structures such as the carotid artery or sixth nerve and to a lesser extent the third, fourth, or fifth nerves, and again the risk of meningitis as a result of operation is diminished. By operations on the cadaver it has been shown by these observers that an approach through the canine fossa and maxillary antrum of one side into the sphenoidal sinus of the opposite side gave a line which, after penetrating the lateral sphenoidal wall, entered the cavernous sinus, and this procedure was followed in a number of cases without injury to any important structure.

General treatment with specific antisera or vaccines may be tried, or bactericides may be injected into the blood stream. In the present series one case was treated with 10 c.cm. of mercury perchloride, 0·1 per cent., intravenously, though with no appreciable good effect.

Preventive measures, by efficient observation and treatment of all conditions liable to give rise to cavernous sinus thrombosis, are by far the most important lines of treatment. Ear infections usually come to an otologist before the cavernous sinus symptoms develop. The ethmoidal and sphenoidal air sinuses must always be remembered as a possible source of infection, and in this instance again it is usually in a special department that the condition will be finally diagnosed. It is in the cases of minor facial sepsis that the opportunity of making an early diagnosis of this severe complication may fall to the lot of any medical man. The furuncle or insect bite or other small septic focus is not serious enough to be sent away for hospital treatment; if it is already in the casualty department, the house surgeon will be in charge of the case.

In any case of minor facial sepsis, especially when the "danger area" is involved, headache should be regarded with suspicion, and if the headache is becoming worse in spite of local treatment of the focus, thrombosis of the sinus should be suspected. Giddiness or a feeling of drowsiness or dullness, and an unduly high temperature and pulse, will single out in a few months at a general hospital perhaps 20 cases of the type that may develop cavernous sinus thrombosis. Malaise is an indefinite symptom, and some authorities state that the onset is usually associated with euphoria.

Free incision and squeezing are generally recognised as dangerous and some authorities advise conservative means only. Hinton (1927) advises hot flax seed poultices and Speer (1929) advocates hot dressings of a saturated solution of magnesium sulphate. Mainzer (1930) states that "surgery of the face in minor infections is bad surgery" and recommends hot applications only.

While recognising the risk of opening up uninfected tissue and lymph spaces, and dislodging thrombi and breaking through the barrier of leucocytes, it seems obvious on general surgical principles that the pus should be evacuated at the earliest time it can be done with safety.

The following suggestions are given in detail as being safe and efficient methods of dealing with the focus, drainage being obtained without the involvement of healthy tissue.

For small septic foci about the nose and eye, puncture should be made with a sharpened match-stick dipped in liquid carbolic acid. For larger abscesses, hot applications should be employed until the first sign of pointing can be seen. The skin over this area is then removed and, if any pus escapes, a small pledget of cotton-wool soaked in 10 per cent. cocaine should be lightly packed into the cavity. A few minutes later an orange-stick dipped into *liquor hydrargyri nitratis acidus* should be gently bored into the core. Care must be taken that all bleeding has stopped and that the wound is dry before the acid is applied, as otherwise the skin may be burnt by an overflow of acid. The treatment is painful, as the acid soon burns past the cocainised area. This method rapidly improves the local condition without the danger of free incision, and may be repeated if necessary.

In the case of a neglected carbuncle of the face, particularly of the upper lip, if there be any of the warning symptoms of sinus thrombosis, the carbuncle should be excised and carbolised, and not incised with undercutting of the flaps as is often practised in order to obtain a good cosmetic result. A plastic operation can restore the lip, whereas inefficient excision and drainage may lose a life.

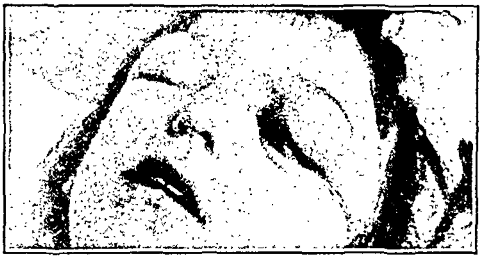
Six Case Reports.

CASE 1, a girl, aged 10, was admitted on Sept. 8th, 1924, complaining of "headache and swelling of both eyes." Eleven months before she had had an "abscess" in the nose following many colds. Seven months before she had had measles, and a discharge from the ear which had ceased five months earlier. Eight days previously there had been a small abscess on the nose on the site of an insect bite; five days before admission she had had sleeplessness and had been feverish; on the next day the doctor had been called in and her temperature had been 100·4° and her pulse-rate 88. She had had severe spasmodic frontal headache. There had been no sweats, rigors, or vomiting, but she had been very restless. Her eyes had appeared natural and her reflexes normal. Peripheral reflexes had been present and equal on both sides. Three days before admission the abscess had been incised and the pus evacuated. One day before, at 6 A.M., swelling of the left eye had commenced and had been marked by midday. On the morning of admission there had been extensive swelling in the left orbital and temporal region. There had been muco-pus in the left conjunctival sac and some œdema of the right lids. The temperature had been 101° and the pulse-rate had been 98. In the evening the temperature had been 103°. There had been no vomiting, rigors, or sweating.

On admission she looked ill, and lay still, moaning. She cried when handled, but would answer questions and tell her age. She complained of frontal headache. Her eyelids were bluish-red and œdematous. Her eyes were tender, more on the left than on the right. Conjunctivitis was present, but no nystagmus or ophthalmoplegia. There was doubtful proptosis of the left eye. There was tender fullness on both sides of the neck behind the angle of the jaw, decreasing downwards, greater on the left than on the right. No definite swelling was felt. The tongue was furred. A small furuncle was situated on the tip of the nose to the right side, and was discharging freely. The nasal mucosa was inflamed, but no pus or muco-pus was seen. The abdomen and limbs showed nothing abnormal. Reflexes were present and equal.

Examination of the eyes showed the right cornea clear but a vitreous haze; a slight degree of papillœdema was present. The left disc was not seen owing to corneal mistiness. The left maxillary antrum was opaque to transillumination but the frontal sinuses appeared normal. Nothing abnormal was discovered in the urine.

FIG. 2.



Photograph taken on Sept. 9th. The infected insect bite can be seen on the right side of the tip of the nose and is surrounded by an area where the skin is dry and scaly. The left eye is proptosed, the conjunctiva is projecting through the palpebral fissure, it is plum-coloured and there is a sero-sanguineous discharge trickling from the eye. The right eye is proptosed to a lesser degree than left though seen more clearly in the photograph. The œdematous condition of the forehead may be made out immediately above the bridge of the nose and is continuous with swelling of the forehead.

On the next day the swelling increased, extending up into the scalp for two inches. On the left it was limited by the attachment of the temporal fascia, and on the right it had spread from the orbital region to the area in front of and below the ear. There was extreme tenderness over this area but not over the mastoid process. There was no redness of the skin and the superficial veins were not engorged. Œdema of the eyelids was very marked. There was proptosis of both eyes, more marked on the left than on the right. Chemosis was present, the conjunctiva being extruded through the palpebral fissure on the left side. Swelling extended down the neck and obliterated all the fossæ on the left side of the face. There was extreme tenderness.

X ray examination showed the left antrum opaque. The ethmoidal cells were hazy on both sides, more markedly so on the left. The frontal, mastoid, and sphenoidal air cells appeared clear. The temperature was 103° and the pulse-rate was 128. At 4 P.M. rigidity of the neck was present. Reflexes were absent in the upper and lower limbs and in the abdomen. The Babinski response was extensor on both sides and Kernig's sign was positive. Lumbar puncture yielded 20 c.cm. of opalescent cerebro-spinal fluid under pressure; its withdrawal was followed by improvement in the pulse and more regular breathing. The cerebro-spinal fluid clotted in 15 minutes. There was an increase of albumin and a slight increase in the globulin; Fehling's solution was not reduced. The blood count revealed 7800 white cells and over 1500 polymorphonuclear leucocytes per c.mm. Staphylococci were found in films and cultures.

On the next day there was left hemiplegia. There was marked chemosis in both eyes and a serosanguineous discharge. Proptosis had increased. The left inferior nasal fossa contained blood-stained pus. On Sept. 11th the temperature was 104° and the pulse-rate 140. The patient died at 5.45 P.M.

Post-mortem Examination.—A diagnosis of furuncle of the nasal skin, cavernous sinus thrombosis, meningitis and pyæmia was made. The right orbit was removed intact, including the cavernous sinus posteriorly, and the angular vein and skin of the nose anteriorly. It was hardened in formalin and a dissection made at a later date. The superior ophthalmic vein was dissected from the angular vein to the cavernous sinus as it lay deep to the superior rectus and the levator palpebræ superioris. It was filled with greenish-yellow pus and was bathed in pus in places, the wall of the vessel having broken down. The inferior ophthalmic vein showed areas of thrombosis, though it mostly contained pus.

There was meningitis at the base of the brain and over the right motor area. The veins on the surface of the dura were thrombosed and the middle meningeal vein on the left side contained pus. Both cavernous sinuses and the circular sinus contained pus. The lateral sinus and jugular bulb were not thrombosed. The left carotid sheath was bathed in thick green pus, which had apparently spread from the pharyngeal plexus of veins. The superficial veins of the forehead, when cut across, were seen to be filled with pus. The heart, lungs and kidneys showed small abscesses.

Microscopic examination showed that there was acute basal meningitis. The pia-arachnoid was much thickened and congested. There was dense polymorphonuclear infiltration. Fibrinous exudate was present in the meninges but with little hæmorrhage. There was no inflammation of the brain substance. Staphylococci were seen in the inflamed meninges. The mucous membrane lining the sphenoidal air sinus showed œdema of its submucous cellular tissue but no evidence of active inflammatory change when stained by hæmatoxylin and eosin. No organisms were seen when stained with Gram's stain.

The coats of the carotid artery in the petrous bone were normal. The lumen was filled with clot, part of which may have been ante-mortem, as seen by the denser peripheral clot. The periarterial lymphatics were seen to be loaded with polymorphonuclear cells when stained by hæmatoxylin and eosin. Gram-positive cocci in groups were seen in the peri-arterial lymphatics and tissues; also a few colonies in the lumen of the vessel, indicating that the dense part of the clot was probably an ante-mortem mural clot.

CASE 2, a railwayman, aged 23, was admitted on July 28th, 1924, complaining of "headache and swelling of the left eye." Two days before, while he was sifting some small stones, a fragment had flown up into the left nostril. He had removed it ten minutes later. On the next day there had been a slight swelling on the left side of the bridge of the nose, and headache in the left orbital region. He was admitted in the evening with swelling of the left side of the nose extending into both eyelids.

On admission the patient looked ill; his temperature was 100·4° and his pulse-rate 72. There was swelling of the lids, conjunctival œdema, and chemosis. The left eye was proptosed and fixed; the tension was increased but the fundus was normal. There was a red tender swelling to the left side of the bridge of the nose, involving the left eyelids and extending across to the right. No abrasion was seen in the vestibule and nothing abnormal could be seen in the anterior nares. There was no tumour or tenderness along the line of the jugular vein, and no enlarged lymph glands were palpable. There was rigidity and tenderness of the posterior muscles of the neck. The reflexes were normal.

An incision from the inner part of the supra-orbital margin, extending downwards beside the nose, was made and the lacrymal bone and frontal process of the superior maxilla were exposed and the anterior ethmoidal cells opened. No pus was found. The middle and posterior ethmoidal cells and then the left sphenoidal cell were opened. The mucous membranes were œdematous but no pus was found. All the tissues were very congested and bled freely. The left middle turbinate was removed and free connexion between the ethmoid cells and nasal cavity made. A drainage-tube was inserted from the anterior nares to the sphenoidal sinus.

The cerebro-spinal fluid was turbid with spontaneous clot. Fehling's solution was not reduced. The blood count showed many polymorphonuclear cells. No organisms were seen in film and no growth obtained on culture. Sensitised streptococcal vaccine (one hundred million) was given. On July 30th the patient became comatose. The temperature was 106°, the pulse-rate 158, and the respiration-rate 31. The patient died at 5 P.M.

Post-mortem Examination.—The diagnosis was abscess of the left ala nasi, bilateral cavernous sinus thrombosis, and basal meningitis.

In the operation area there was an unhealed scar on the left side of the nose which continued back into the ethmoidal region. There was no apparent connection between the operation area and the cranial contents. The left ala nasi was the site of deep-seated pus. The superior ophthalmic veins were thrombosed. There was bilateral thrombosis of the cavernous sinus and circular sinuses, which contained pus. Basal meningitis was present in the region of the cavernous sinuses. The pus contained staphylococci.

Microscopic examination showed acute meningitis; the pia-arachnoid was much thickened, congested, and infiltrated with polymorphonuclear cells. There were areas of hæmorrhage into the meninges. Similar cellular infiltrations were seen around the vessels, spreading along the perivascular sheaths, and in the walls of the veins but not of the arteries. Gram-positive organisms (staphylococci) were present in large numbers in the meninges.

CASE 3, a woman, aged 48, was admitted on March 21st, 1923, complaining of "inability to see clearly out of the left eye." Five days before she had noticed a small red, painful spot at the corner of the mouth on the left side. Next day the swelling and pain had increased and had spread to the left eyelids; there had been epiphora. On the next day the mouth had been painful and there had been shooting pains in the left eye. Two days before admission the pain had become worse, with headache and soreness of the tongue. The day before there had been discharge of yellow material from the corner of the mouth. The patient had vomited on three occasions.

She walked into hospital and, though her vision was noticeably impaired, the mental condition was quite good. Headache was not a prominent symptom. The temperature was 103° and the pulse-rate 110. At 2 P.M. headache was present and becoming severe. On the left side the eyelids were very much swollen, red and shiny. Conjunctival œdema, a slight degree of chemosis, proptosis, and corneal ulceration were present. There was a slight swelling of the lids of the right eye and conjunctival œdema. The pupils were equal in size and reacted normally. The swelling of the left eye was continuous with a swelling on the left of the nose and the main swelling at the left angle of the mouth. This was hot, red, and discharging yellow pus, with a slough visible externally and in the mouth. It was not very painful.

An operation was performed at 5 P.M. and an incision of the septic focus was made at the angle of the mouth; the cavity was scraped and packed. At 12 midnight the patient was roused with difficulty, and was later unconscious. The temperature was 107·4° and the pulse-rate 160. No evidence of meningitis was obtained. She died next day at 2.30 A.M.

Post-mortem Examination.—The diagnosis was carbuncle on the upper lip, bilateral cavernous sinus thrombosis, basal meningitis, and pyæmia.

Conjunctival œdema and hæmorrhages were found in the orbit, worse on the left than on the right. Thrombosis was present in the cavernous sinus and circular sinus, with some suppuration, and the meninges showed acute inflammation over the pons. Infarcts at the base of the right lung were beginning to suppurate. There was early pleurisy over these areas.

Microscopic examination revealed fatty degeneration in the heart muscle cells (osmic stain); one small area of polymorphonuclear-celled infiltration of myocardium was present. A section of the posterior part of the lung through an infarct was made; there was hæmorrhage and polymorphonuclear infiltration, with abscess formation. Acute suppurative meningitis was present round the pons.

CASE 4, a woman, aged 30, was admitted on Nov. 13th, 1923, complaining of "severe headache and swelling of the eye." Fourteen days previously there had been a small abscess on the left side of the nose, which was very painful and swollen, and some headache. The abscess had been treated with fomentations and had discharged and healed, but the headache had persisted. Four days before admission the headache had become worse and there had been throbbing in the back of the neck, in spite of treatment, with a temperature of 100·5°. The day before admission the temperature had been 101·8° and the pulse-rate 85. There was much œdema, proptosis and photophobia of the right eye, and œdema and photophobia of the left eye. Knee-jerks had increased.

On admission at 9 A.M. the patient looked ill; her temperature was 104·5° and her pulse-rate 120. She had a dusky, cyanosed appearance. The eyelids were closed with the œdema, conjunctival œdema was marked, bilateral proptosis was present but no lesion on the nose was visible. The patient died at 4 P.M.

At the *post-mortem examination* proptosis was still marked. The cavernous sinuses and pituitary fossa contained pus which welled up from the cavernous sinus. The pontine area showed early acute meningitis and some meningeal hæmorrhage. The accessory air sinuses were normal.

CASE 5, a woman of 26, was admitted on March 3rd, 1921, complaining of "swelling of the face and pains all over the body." Six days previously there had been a small septic spot at the angle of the mouth on the left side. Four days before she had been "feverish" and had had pains all over, and three days before she had been treated with "serum." She was sent to hospital as acute parotitis.

On admission the patient looked ill; the temperature was 103·4°, the pulse-rate was 118, and the respiration-rate 44. Nothing abnormal was noticed in the eyes except a swelling of the left lids. A very painful, red swelling was present on the left side of the face, extending to the right side. In the chest there was pleural friction at the right base.

At operation a carbuncle was excised, which was found under anæsthesia to be situated deeply in the cheek, with sinuses inside the mouth.

On March 4th the temperature was 104°, the pulse-rate 110, and the respiration-rate 28. Increased swelling of the face, orbital cellulitis and conjunctival œdema were noted. On March 5th the temperature was 104°, the pulse-rate 110, and the respiration-rate 48; proptosis was present. On March 6th at 12.30 A.M. the temperature was 106·4°, the pulse-rate 150, and the respiration-rate 48. The patient died.

CASE 6, a man, aged 20, was admitted on Jan. 28th, 1926, complaining of "severe headache." A week previously there had been a furuncle on the left ala nasi. Four days before there had been swelling on the left side of the nose and the left eye, the temperature had been 101° and the pulse-rate 88. There had been no chemosis or proptosis. Two days before admission the temperature had been 98·2° and the pulse-rate 68. The swelling had diminished and the eye had been normal. The patient had vomited and complained of headache. The day before admission he had again vomited and the headache had still been present. Stiffness of the left side of the face and some œdema of the left lids had been present, but the eyes had been normal. He had been given 10 c.cm. of antistreptococcal serum. There had been severe headache at 10 P.M.

On admission the temperature was 100° and the pulse-rate 90. The patient was very ill and semi-conscious. There was swelling, œdema, redness and pain about the left orbit. Proptosis of the left eye was present and its movements were impaired and the reaction sluggish. There were no signs of meningitis. An incision in the left orbital region for cellulitis was made. There was hæmorrhage and some purulent material from small localised abscesses. The temperature was 104° and the pulse-rate 140. The patient died at seven in the morning on the next day.

Conclusions.

1. Cavernous sinus thrombosis occurs in a small percentage of cases of infection about the nares and upper lip. 2. It occurs owing to the close and free connexion between the angular vein and the cavernous sinus. 3. It occurs as a result of small infective foci in which the tension is high, resulting in a rapid diffusion of the toxins with the invasion of a vein from without. 4. Headache, which increases in spite of treatment to the focus, suggests this serious complication. Chemosis and proptosis are signs which leave no doubt that thrombosis has occurred. 5. Orbital cellulitis is usually associated with the cause of cavernous sinus thrombosis and should be considered in the diagnosis. Sphenoidal and ethmoidal sinusitis may be confused with this condition. 6. A method of treating the septic focus which avoids the dangers of free incision is suggested. 7. The treatment of the infected sinus is palliative, though drainage by one of the routes described may be attempted.

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SPONTANEOUS TUMOURS IN MICE.

INFLUENCE OF DIET AND AGE.

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Cancer is rarely seen in a population living a simple and natural life, says F. L. Hoffman, after investigating the incidence among the natives of America from the Arctic to the Falkland Islands. McCarrison and Halliday had each reached this conclusion through prolonged experience of the hill tribes of India. Similar reports have been made of Northern Nigeria and Abyssinia by Dyce Shrap, of the Orange Free State by Fouche, and of West Africa by Tippier. Cancer was formerly never seen among the Basutos by Casalis de Pury, but now, since the introduction of infections such as syphilis, and of alcohol, by civilised people, cancer has become common, and also among the negroes of the United States of America. In British Guiana the negroes are reported to have twice as much cancer as the Indians; the latter are mainly agriculturists, and of simpler habits of life.

The cancer cases reported by Kuhne as seen among Chinese in a hospital in Canton Province were one-tenth as numerous as those seen in the Edinburgh Hospital. In Greenland only nine cases among Esquimaux were recorded in five years (Hindhede). The nomadic races of the Near East no less show a relative immunity to cancer which is ascribed by Fallscheer Zürcher to their simplicity of life. The French Canadians, who are farmers, are reported to have only half the incidence of cancer of the British Canadians (Guest). Havana City shows, says Hoffman, a high cancer mortality-rate, while in the rest of Cuba the rate is relatively low.

Cancer is particularly a disease of old age, and it has been said that natives die too young to develop cancer; also that death certification is so bad that one does not know what they do die of. Against this argument is to be set the fact that the clergy in Britain, who are longest lived, are least subject to cancer. Coalminers, butchers, and publicans, who live less long, have two or three times the cancer-rate of the clergy (occupational mortality figures for 1910–12).

CANCER AND DIET.

It is claimed in popular health papers that a deficiency in the diet of civilised people, of essential substances, such as vitamins, is a cause of cancer. Against this view may be put the fact that the cities of Denmark show the highest cancer mortality in Europe, while the use of sugar and sweets therein is not excessive.

Again, Russians in the cities, who did not eat white bread, had a cancer mortality about equal to that in England. In Holland there is more cancer of the food canal and less of the breast and uterus than in England, while in Italy the cancer mortality-rate is altogether lower.

The Jews, who show a tendency to obesity and diabetes, like the Dutch, have more cancer of the food canal and less of the reproductive organs. In Germany the statistics show the digestive organs among males to be the chief seat of cancer, and next the skin, while among females the reproductive organs head the list, and next the digestive organs and then the skin. An investigation of the vital statistics of a number of houses of Catholic religious orders showed that cancer occurs in a population abstaining from flesh food, and lent no support to the view that among such populations the relative incidence of cancer is low (Greenwood and Copeman).

Hoffman thinks that the irritation of the food canal by eating too much may be a predisposing factor in cancer causation. Young fowls undergoing intensive feeding are said to show a noteworthy percentage of tumours.

Fujimaki observed epithelial proliferation and small papillomata in the gullet, fore-stomach, bladder, &c., of rats fed on a diet deficient in vitamin A. In one case there was found a tumour of the lung, taken to be a metastasis, but the illustration of this shows that it was really one of the spontaneous tumours so commonly found in the lungs of rats and mice. Cramer found such proliferations no less in some old mice fed on ordinary laboratory diets, and Erdmann and others were unable to produce tumours of the stomach by a diet deficient in vitamin A.

McCarrison has contrasted the effects on rats of an ill-chosen diet with a well-selected one. The bad diet led to intestinal and pulmonary disease, and villiform papillomatous outgrowths occurred in the fore-stomach, but no cancer resulted. During several years of experiment both he and Cramer have never found evidence of cancer being caused in animals by ill-chosen diets. Underfeeding may delay the growth of spontaneous tumours, but is disadvantageous to the life of mice in the case of very malignant tumours (Rous).

It has been claimed by Maisin and others that a diet of liver and whole meal enhances the production of tar-cancer, when compared with a diet poor in vitamins, but this appears to be due to the animals living longer on the liver diet. Cramer was unable to confirm this claim.

After a review of the evidence the Imperial Cancer Research Laboratory reported that "there is no reliable evidence, experimental, statistical, or clinical, which would indicate a causal correlation between cancer and the absence, or the presence, or the excess of any particular dietetic constituent. Sensational statements to the contrary are unfounded and ill-considered, and only serve to alarm the public."

ACTION OF IRRITANTS.

Long-continued sources of irritation are known to be causes of occupational cancer—e.g., tar, soot, hot charcoal in the kangri pots used in Kashmir, X rays, mineral oils—all these may produce cancer of the skin, while aniline, naphthylamine, and benzidine may produce cancer of the bladder. Chronic ulcers of the stomach, duodenum, and neck of the uterus not uncommonly result in cancer. Irritation due to chronic constipation is said to be a cause of cancer of the colon. For the induction of carcinoma, says Cheatle, "the irritant must be applied directly to the actual cells, which are eventually the parents of the tumour, and there is a time factor which appears to depend upon the intensity of the application." Thus Fibiger by feeding rats on the larvæ of a nematode (*Spiroptera neoplastica*), isolated from the muscles of cockroaches, induced gastric cancer in over 50 per cent. of these rats. The freed larva burrows superficially in the stomach lining and there develops to maturity, inducing the epithelium to proliferate and become cancerous. The nematode may lodge in the tongue, but not in the gullet or any other part of the alimentary canal.

By injecting tar into the stomach of a rat a squamous-celled epithelioma has been produced in the cardiac portion of that organ of the same type as that produced by infection with this nematode (*Menetrier*). Cancer has been produced in the rectum in one out of 16 mice, and in the mouth in one out of 10 mice, by the injection on alternate days of 0·1 c.cm. of 50 per cent. alcohol into one or other orifice (Krebs). It is claimed by Bagg that mammary cancer can be produced in mice by ligating the ducts of the gland.

There is evidence that humoral conditions affect the development of cancer. Thus it is said that tumour tissue, excised and autolysed under suitable conditions, when inoculated makes animals hypersensitive to the growth of transplanted tumour (Chambers and Scott). Cramer excised and minced up the spleen and returned it to the peritoneal cavity in a number of mice. Cancer resulted from tar-painting of the skin much earlier in these than in other mice.

EVIDENCE OF INCREASE OF CANCER.

While statistics drawn from the records of autopsies made in Glasgow Infirmary showed no spectacular increase in cancer in recent years, an increase in cancer of the colon was more evident than of any other site. In the United States of America cancer mortality is reported to be increasing mostly in regard to the food canal, and the foreign-born have a much higher rate than the native-born in this respect; possible factors which appear common to the foreign-born in the United States of America, and to the lowest social class in Britain are a poor diet and bad teeth, alcohol, and syphilis. Sources of chronic irritation have time to act with age, and thus an investigation of almost 1000 autopsies at a French hospital for the aged showed incidence of cancer in 7·7 per cent. (Roussy).

The Bureau of Census, Washington, 1929, showed the relation of age to incidence of cancer per 100,000 as follows:—

Years.	1925.	1926.	Years.	1925.	1926.
Under 5	3·2	3·6	35–44	59·4	59·8
5– 9	1·5	2·2	45–54	165·9	163·0
10–14	1·7	2·1	55–64	382·5	361·2
15–19	3·3	3·6	67–74	743·2	708·9
20–24	5·0	5·3	75 and over	1070·8	983·6
25–34	15·5	15·8			

Three-quarters of the apparent increase in the cancer mortality of Scotland is attributed to the increasing proportion of older people in the population, and the rest mainly to improved methods of diagnosis.

The expectation of life at birth has been extended by some 17 years, and mostly by saving the children. The mortality-rate between the ages of 20 and 50 has, however, fallen, and when the crude death-rates from cancer are standardised for the change of population at each age group an apparent increase of 25 per cent. drops to one of only 4 per cent., and most of this increase is due, according to Shearer, to better diagnosis and more accurate certification of the cause of death in the aged.

HEREDITY AND CANCER.

The inheritance of a tendency to cancer has been much discussed. In one family a sarcoma occurred in several generations, and in the same situation (Manson), while Warthin, in four families, found evidence of inherited susceptibility to cancer, and Griffith Evans has recorded two families with apparent strong hereditary susceptibility. Werner thinks that the nature of the environment is the potent cause; consanguineous marriages, frequent in certain families, do not, he says, increase any such susceptibility. Most conclusive is the fact that the actuaries of insurance companies find no evidence of inheritance of cancer. In Switzerland the average death-rate for 1911–13 per 10,000 inhabitants aged 40 or over has been, for departments containing a majority of the race *Homo europæus*, 30·63, for departments containing a majority of the Cevenal race, 14·57, and for departments containing a majority of the race *Homo meridionalis*, 13·90 (Pittard).

Strains of mice have, however, been bred which show greatly increased susceptibility to spontaneous cancer, and these strains must have either inherited this susceptibility or been subject to transmission of some cause of infection which results in cancer. Maud Slye has published pedigree charts illustrating inheritance of cancer, but the evidence on which these are based is not very convincing. Lynch has secured 65 per cent. of mammary gland tumours in the first strain of females bred from mice with a high incidence of this tumour. Marsh has bred a strain of mice in which no less than 90 per cent. of the breeding females were subject to mammary carcinoma; the males did not develop this cancer. Dobrovolskara-Nzavadskaia crossed a female mouse affected with mammary cancer with a non-cancerous male and secured a stock of which almost 50 per cent. were affected with cancer. But, says Cramer, in the case of all such stocks, on continued inter-breeding, the high cancer-rate does not appear to continue. Lynch claims that susceptibility to tumour formation produced by tar-painting of the skin may be inherited. Crossing a less susceptible stock with a highly susceptible one, and tar-painting the progeny, increased the incidence of lung tumours greatly.

Borrel believes in infection—e.g., with a nematode—as the cause of spontaneous mouse cancer; a control experiment appears to be required in which females of a low susceptible stock are kept with females of a highly susceptible stock. The experiments given below show a varying, but often high, incidence of tumours, which may be due to infection, although the cause has not been detected.

Experimental Observations.

To study the influence, if any, of age, diet, and bedding materials on the occurrence of spontaneous tumour, a stock of mice were selected at random from the common breeding stock, which had been kept for some years under good conditions at the National Institute for Medical Research. The stock so taken was maintained, bred from, and kept going by Miss M. Brad for six years under the best conditions of cleanliness and care. Mates were chosen at random for breeding, and the males and females not so used were kept apart, for males, if brought up together and not mixed with females, do not fight. The mice in each successive stock were kept till they naturally died, excepting those with obvious tumours. These were killed when the tumour became large. Autopsies were done on all mice, and microscopical preparations made of any tumours. At first Dr. J. M. Murray, and later Dr. J. R. Perdrau, kindly confirmed the nature of the tumours which were found.

Three years in a mouse corresponds to very old age in a man; the process of growing to maturity and of decadence with advancing age can be studied in this period of time.

Stocks of mice were kept on different diets and on different bedding. Some were kept on what approximates to a natural diet for wild mice: (1) barley, oat, and wheat grain, and fresh green food; some on (2) canteen lunch diet, cooked meat, and vegetables with the usual amount of common salt added, and pudding and tinned fruit; some on a (3) canteen tea diet, one poor in vitamins, white bread and margarine, rock cakes and biscuits, and a little milk; some on (4) a diet found by Dr. A. B. Hill to be the average one of Essex farm labourers, low in protein value; and some on (5) the same diet, a third part of which had been browned by frying, in order to see whether cancer-producing products were produced in food by such burning. Some of the stocks were fasted two days each week, so as to observe the effect, if any, of such abstinence.

The following beddings were tried on mice fed on Diet 1: (1) sawdust and elastin (fine wood shavings); (2) sawdust and cotton-wool; (3) peat and hay; (4) peat and cotton-wool; (5) peat and elastin; (6) sawdust and hay; (7) hay and cotton-wool. The mice on the other diets were kept on cotton-wool and sawdust.

Cancers have occurred indifferently in mice on all diets and on all beddings. The significant influence has been age. In mice dying under 1 year, 2 per cent. of the tumours occurred; in those dying between 1 and 1½ years, 8 per cent.; in those dying between 1½ and 2 years, 40 per cent.; in those dying between 2 and 2½ years, 34 per cent.; and in those dying between 2½ and 3 years, 16 per cent. These figures are striking as the number of mice diminished with age and few lived over 2½ years. The mice fed on the tea diet were healthy, but small in size, could not breed, and in old age were liable to skin troubles, which could be set aside by addition of green food. Tea diet with hay as a bedding produced mice larger in size and able to breed; the seeds in the hay added necessary vitamins. Diet 5, one-third fried, proved less favourable than the diets 1, 2, and 4, on all of which mice grew to be fine healthy animals and bred well. Elastin as a bedding is not so warm as cotton-wool, and mice on this bedding are, in consequence, more active and do not grow so large.

Only one stock, and that a small one, died out just before reaching the age of one year; the loss of this stock was due to pneumonia, a common cause of death among tame mice. The animals were kept in a room at about 60–65° F., and no definite relation was noted between season and weather conditions and deaths from pneumonia. The research began with a stock of 44 males and 44 females, and 35 stocks in all were bred, giving a total of 793 mice, of which 400 were males and 393 females. There spontaneously occurred among these mice 140 tumours of the lung, 76 mammary carcinomas, 29 tumours of the liver, 23 lymphomata, 3 tumours of the thyroid, a few tumours of the ovary, testis, bowel, and some epitheliomata, totalling in all 303. Tumours occurred in 31 per cent. of the males and in 49 per cent. of the females. The higher percentage in females was due to mammary carcinoma. Tumours occurred in those fed on a poor vitamin diet and in those fed on a rich one. They occurred in those on the diet of raw grain and green food even more than in those on a cooked diet. They occurred also in a stock kept on an artificial diet of casein, rice starch, salt mixture, cod-liver oil, and marmite. In the case of the over-cooked diet the number of tumours was large in two stocks, but small in a third, and nil in a fourth one, but these two stocks died out soon after one year was reached. One stock of mice on Diet 1 were fasted throughout life for two days a week, and even for three days a week for one month; the mice made up weight on the non-fasting days, but remained smaller although as sleek, healthy, and long-lived as well-fed stocks. Tumours occurred in this stock during old age no less than among other stocks. The conclusion then was reached that diet had no definitely significant influence on the occurrence of tumours, nor had the character of the bedding any influence, as shown by the Table (Diet 1). The incidence of tumours varies in stocks on the same diet and bedding as shown in Table I. just as much as it varies between stocks on different diets.

TABLE I.—*Diet 1: Raw Grain and Green Food.*

Bedding.	No. of mice.	Males.	Females.	Total tumours.	In males.	In females.	Mammary.	Lung.	Liver.	Lymphoma.
1	26	13	13	7	1	6	4	—	1	1
2	17	2	15	10	3	7	6	—	—	—
3	57	24	33	31	11	20	10	11	1	3
4	34	11	23	16	6	10	8	6	—	1
5	35	17	18	9	4	5	—	3	—	2
6	27	15	12	12	5	7	1	8	—	1
7	15	10	5	3	3	—	—	2	—	—
8	22	12	10	4	1	3	1	3	—	—
9	18	12	6	10	6	4	3	6	1	2
10	13	7	6	3	2	1	—	2	—	—
11	19	7	12	10	4	6	4	4	1	—
12	13	5	8	8	2	6	—	3	—	—
13	18	10	8	8	4	4	2	4	1	1
14	27	19	8	13	8	5	—	11	1	1
15	22	13	9	13	6	7	1	6	4	1
16	9	—	9	5	—	5	4	—	—	—
—	372	177	195	162	66	96	41	69	10	12

Tumours in 43 per cent. of the mice.

Nature of bedding:—(1–5) cotton-wool and sawdust; (6–7) cotton-wool and hay; (8) elastin and peat; (9) hay and peat; (10) cotton-wool and sawdust; (11) elastin and sawdust; (12) cotton-wool and sawdust; (13) cotton-wool and peat; (14–15) elastin and peat; (16) cotton-wool and sawdust.

TABLE II.—*Diet 2: Canteen Lunch.*

No. of mice.	Males.	Females.	Total of tumours.	In males.	In females.	Mammary.	Lung.	Liver.	Lymphoma.
27	14	13	7	1	6	4	1	—	1
17	9	8	3	—	3	2	—	—	—
44	23	21	10	1	9	6	1	—	1
Tumours in 23 per cent. of the mice.									
Diet 3: Canteen Tea.									
41	24	17	17	8	9	2	7	3	—
13	8	5	4	2	2	2	2	—	—
20	10	10	7	4	3	—	6	2	—
74	42	32	28	14	14	4	15	5	—
Tumours in 37 per cent. of the mice.									
Diet 4: Essex Labourers.									
27	8	19	7	2	5	3	3	—	1
27	14	13	3	1	2	1	1	2	—
7	2	5	1	—	1	—	—	—	—
14	9	5	8	3	5	3	4	—	1
16	10	6	5	2	3	—	3	1	1
25	11	14	11	4	7	1	8	1	—
25	8	17	8	—	8	—	5	2	—
141	62	79	43	12	31	8	24	6	3
Tumours in 30 per cent. of the mice.									
Diet 5: Essex Labourers. One-third Fried.									
47	31	16	30	11	19	7	10	3	4
23	11	12	2	—	2	1	1	1	—
42	31	11	21	14	7	—	8	1	1
12	9	3	—	—	—	—	—	—	—
124	82	42	53	25	28	8	19	5	5
Tumours in 42 per cent. of the mice.									
Artificial Diet.									
13	7	6	4	2	2	1	2	—	—
14	2	12	9	—	9	—	6	2	1
27	9	18	13	2	11	1	8	2	1
Tumours in 48 per cent. of the mice.									
Diet 1 and Fasting on Two Days a Week.									
11	5	6	7	4	3	—	4	1	1

Tumours in 63 per cent. of the mice.

While the incidence of tumours has been very high no obvious source of irritation has been found. Tapeworm cysts in the liver were occasionally found, but no connexion of these with tumour formation was evident. No nematodes were observed. Tumours of the lung were the most frequent; such tumours claimed to be metastases, or induced by tar, may then, in some cases, be spontaneous.

CONCLUSIONS.

Spontaneous tumours occurred frequently in a stock of mice kept in excellent hygienic condition. The incidence varied considerably in successive stocks which were raised over a period of six years by random in-breeding. The variations in Table I. on the same diet and bedding are large. Different diets, or beddings, had no apparent significant influence on the incidence. Tumours of the lung were common, and may, perhaps, be associated with the liability of mice to pulmonary infection.

Tumours of the Lung.

Tumours of the lung were observed by Harland in 103 out of 275 mice having spontaneous tumours; a very high percentage of all spontaneous tumours observed in mice by Tysser were in the lungs. Many of these tumours are circumscribed, but may grow to a size which destroys life; others are infiltrating and malignant in character. It is recognised that so-called benign tumours—e.g., tar-warts—may become malignant, and it is not just then to exclude the tumours of the lung from the list of spontaneous cancers.

When the lungs of old mice are examined microscopically, localised foci of inflammation are often to be found. With this liability to microbic infection may go chronic irritation, and the tendency to formation of tumours. Patches of inflammation are not infrequently to be found in the lungs of mice when killed in apparent good health. Overgrowth of epithelium and papillomata of minute size are often to be found in those lungs in which tumours are microscopically evident. Similarly, in the lungs of four human cases of squamous-celled carcinoma of the bronchi, observed by Feyrter, there were found at a number of places, and in bronchioles far removed from the tumour, overgrowths of epithelium and papillary growths of the mucous membrane. In one of these cases an early carcinoma was only detected microscopically.

Feyrter associated the increase of bronchial cancer, which he says occurred after the great influenza epidemic (1918–19), with the inflammatory changes produced by this disease.

In a stock of mice observed by T. Cherry, in which the incidence of spontaneous tumours was 6 per cent., inoculation of small numbers of tubercle bacilli beneath the cuticle raised the incidence to 55 per cent. in males and 71 per cent. in females. Tumours occurred not only in familiar sites in the mice, but in the thyroid, pylorus, colon, pancreas, prostate, and bladder. The tubercle bacilli were taken to be the essential agent in promoting this tumour formation. Lumière claims that carcinoma is a disease of cicatrices; a trauma starts proliferation of cells and some humoral modification comes into play to produce a cancer.

There is a disease of South African sheep called *jagsiekte*, in which proliferation of the alveolar epithelium results as part of an inflammatory process. Cell masses, sometimes papillomatous, grow out from the alveolar wall and fill the cavity. Invasion of the interalveolar tissue also occurs. Some of the epithelial proliferations can be traced to the lining of the bronchioles.

Through irritation by dust cubical alveolar cells become detached and act as phagocytes, such cells may possibly be excited to form a tumour by long-continued chronic irritation.

Schabad tarred the skin of 107 mice for six to eight months and two to three times a week. There survived 96 over three months and 79 over six months. There occurred in 22 a tumour or tumours of the lung, and all these showed either cancer or precancerous lesions of the skin. In those surviving over six months there were lung tumours in 27·8 per cent.

Through frequently painting the skin of mice with tar lung tumours resulted in 66 per cent. of a stock of mice, observed by Murphy and Sturm. R. E. Smith, on the other hand, found tumours of the lungs only in 4 per cent. of mice which were submitted to fumes of tar or to exhaust gases, or painted with gasoline, a figure no greater than that in other stocks of mice which were kept in normal conditions.

Increase of cancer of the lung in man has become evident in mortality returns—e.g., in the United States of America, from 0·6 (1914) to 1·9 (1929) per 100,000, and has been ascribed to the breathing of dust from tarred roads. This increase may be due in part to longer life and better diagnosis—e.g., by X rays. Carcinoma of the lung formed, however, 5·4 per cent. of all carcinomata in Germany 1920–21, and no less than one-seventh of malignant tumours seen during the last five years in the post-mortem room of St. Bartholomew's Hospital were intrathoracic in origin (Maxwell and Nicholson). In the Schneeberg mines in Saxony cancer of the lung has been for years the most significant cause of death, and arsenic in the mine dust has been suggested as a factor.

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PAY BEDS FOR MIDDLE-CLASS CHILDREN.—The Cheyne Hospital for Children, at Chelsea, has provided a small private ward for children suffering from affections which require prolonged treatment, which is said to be the only one in a London hospital of this type. The weekly charge varies from £3 3s. to £5 5s., and the fee payable to the physician or surgeon is subject to confirmation by the hospital authorities. The ward has a southern aspect and overlooks the Thames and the Chelsea Embankment.

UNUSUAL COMPLICATIONS OF DIPHTHERIA.

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PERMANENT HEART-BLOCK.

Complete heart-block during diphtheria does not seem to be an uncommon complication when the myocardium is severely affected. A detailed description of the clinical findings in diphtheritic heart-block has been given by Korach [1] who described two fatal cases. In recent years numerous references to the subject have appeared and many electrocardiographic records have been published. Thus Stecher [2] has reported 19 cases of complete auriculoventricular dissociation. Two cases with notes on the post-mortem findings have been described by Marvin and Buckley.[3] Allen [4] has also published a case but without electrocardiographic tracings. All these cases appear to have terminated fatally, and this result is in agreement with the experience of Harding.[5]

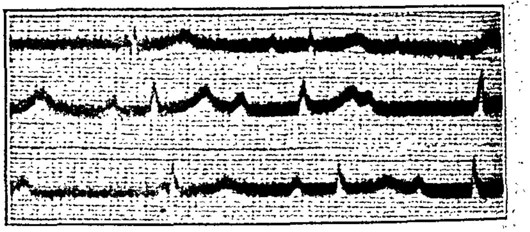
Transitory heart-block, partial or complete, has been noted by many observers, but few of the cases in which heart-block has been complete have recovered, death having occurred from circulatory failure or some other cause such as diaphragmatic paralysis. Ducamp and Janbon,[6] however, have described a single case characterised by complete heart-block in which recovery did take place and the normal rhythm was re-established.

Only very occasionally, it seems, does evidence of a damaged myocardium persist after diphtheria. Parkinson [7] has published the "first undoubted case" of heart-block in diphtheria which later gave place to auricular fibrillation, the latter condition being present on re-examination of the patient after six months. In an interesting article by Reid,[8] details of a case of permanent bradycardia are given and reference is made to a case of complete heart-block following diphtheria, described by Read.[9] Butler and Levine [10] have recently emphasised the importance of diphtheria as an ætiological factor in the production of late heart-block. The comparative rarity of heart-block as a permanent condition following diphtheria justifies the publication of the following case:—

Case 1.—A woman, aged 28, had been admitted 18 years previously to the Birkenhead Infectious Diseases Hospital suffering from diphtheria. She had had no previous illnesses. The diagnosis of diphtheria was confirmed by repeated bacteriological examinations. Peripheral neuritis affecting the hands and feet occurred as a complication in the course of the disease. The patient states that antitoxic serum was given but no details of the treatment are now available. She was discharged from hospital after six weeks. Recovery from the effects of peripheral neuritis was complete in about nine months, but during the first few weeks of convalescence the patient had several "heart attacks" characterised by præcordial pain and dyspnœa. These symptoms disappeared and have not recurred. Her present condition is very satisfactory; she looks well and states that she enjoys perfect health. On moderate exertion however, she is conscious of her heart "bumping" though no irregularity is noticed, and she becomes "crimson in the face." There is no history of fainting attacks or fits. For many years the patient has ridden a bicycle nearly every day without any ill-effects.

The apex-beat of the heart is in the fifth intercostal space, three and a half inches to the left of the midline. The rhythm is quite regular and the rate about 40 beats per minute. The cardiac thrust is easily palpable but there are no thrills. The mitral and aortic second sounds are apparently slightly accentuated, otherwise all the heart sounds are normal. There is a soft systolic bruit at the mitral area conducted about two inches towards the left axilla and there is a short aortic systolic murmur which is not conducted. There are no signs of cardiac failure. The arteries are barely palpable at the wrist and the blood pressure is 124/64. The urine is normal, the tonsils quite healthy, and the Wassermann reaction negative. Electrocardiograms (see Figure) show complete heart-block.

The interest of this case lies principally in the permanent defect of conductivity following diphtheria. Most diphtheritic affections of the heart are essentially of an acute nature, disappearing within a year of the illness, but the present case is an example of a small but definite group of cases in which the heart is permanently damaged by diphtheria. It is also instructive to note that in spite of a permanent and complete heart-block existent for many years no Stokes-Adams seizures have occurred and no subjective or objective signs of heart failure.



Electrocardiogram, showing complete heart-block.

DIPHTHERITIC HEMIPLEGIA.

The subject of diphtheritic hemiplegia has recently been reviewed by J. D. Rolleston,[11] who points out that since the condition was first described by Sir William Gull in 1859 barely a hundred cases have been recorded. Cases which have come to autopsy show that the lesion is vascular in origin and due to embolism, thrombosis, or hæmorrhagic encephalitis. It appears that embolism is the commonest cause and is attributed to an apical endocarditis (Marfan [11]). Diphtheritic endocarditis affecting the mitral valve and causing mitral incompetence is unusual, especially when associated, as in the case mentioned below, with hemiplegia which developed during the acute stage of the condition.

Case 2.—The patient, a girl aged 18, had diphtheria when 7 years of age. The only illnesses she had had previously were chicken-pox and whooping-cough, otherwise she had been healthy in every way. The disease affected the fauces and the diagnosis of diphtheria was confirmed by bacteriological examination. Hemiplegia developed while the patient was very ill during the third week of the illness. At first it was a flaccid paralysis affecting the face, arm, and leg on the right side, but later spasticity developed in both limbs. The doctor who attended the case recalls that the heart was severely affected during the illness and the prognosis was considered to be very poor. Seven weeks after the onset of diphtheria the patient was admitted to an isolation hospital suffering from scarlet fever, and at the beginning of this illness it was noted that the child's heart was already damaged. Recovery from scarlet fever was rapid and uneventful.

Until 12 months ago she had no cardiac symptoms. Lately, however, she has complained of shortness of breath on exertion associated with præcordial pain, stabbing in nature, lasting for a few minutes and completely relieved by rest. The paralytic condition has persisted since the onset, and though there has been a gradual improvement there are signs of early contracture.

The right arm and leg are spastic and wasted and have exaggerated tendon reflexes. The plantar reflex is extensor in type on the right side and flexor on the left side. There are brisk abdominal reflexes on the left side but those on the right are diminished and sluggish. There is a slight right-sided facial paresis. The pupils are equal and react normally. On the left side there is a slight internal strabismus. The organic reflexes are normal, though there has been dysuria for the past four years which appears to be functional in type and not connected with the illness. There are no sensory changes.

The apex-beat of the heart is in the fourth space and four inches to the left side of the midline. The cardiac thrust is *tumultuous* on palpation. The first mitral sound and the aortic second sound are both accentuated, especially the former. There are numerous *extrasystoles*. *These* have diminished with rest in bed. The radial artery is not palpable and the blood pressure is 140/100. The tonsils are healthy. The urine contains a trace of albumin but microscopically there is only squamous epithelium present. The non-protein-nitrogen is 35 mg. per cent., and the urea concentration and dye excretion tests are normal. The Wassermann reaction is negative. The electrocardiogram shows biphasic T waves in lead III., but is otherwise normal.

SUMMARY.

Two cases of unusual complications following diphtheria are recorded: (1) A *case of complete* heart-block persisting 18 years after the diphtheritic infection, and causing *practically no symptoms.* (2) A case of spastic hemiplegia following diphtheria and associated with *mitral regurgitation*. It is surmised that both the hemiplegia and the mitral regurgitation are due to an endocarditis occurring during the course of the diphtheria 11 years previously.

We are indebted to Dr. Eric Murphy (Birkenhead) and to Dr. de Boinville (Liverpool) for permission to publish Cases 1 and 2 respectively.

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THORACOSCOPIC TECHNIQUE
INFLUENCED BY TYPE AND POSITION OF ADHESIONS.

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IN a previous communication[1] the advantages of a single instrument for thoracoscopy and adhesion cutting, and the advantages of the diathermy current have been described. It is not to be thought, however, that it was claimed that these methods were necessarily the best in all cases. It is not entirely a question of one instrument or two instruments, of diathermy or the electrocautery, but what type of case is best suited to one, and what to the other. G. Maurer,[2] of Davos, for example, uses two instruments, and makes use of both the diathermy current for coagulating and the electrocautery for cutting, and his technique and his results are excellent.

There is little doubt, however, that the use of one instrument only is, in many cases, more easy and in a large number of cases very satisfactory. If it is found that the instrument has been inserted in a spot which makes access to the insertion of the adhesion awkward, even after careful localisation, as previously described, another diathermy electrode can easily be inserted through another cannula in another place, if this seems simpler than reinserting the operating thoracoscope. The 30° telescope would then serve as the source of illumination. The electrode can be a separate one, or the operating thoracoscope may be used as a simple electrode.

There is, however, one type of adhesion which is not well suited to the diathermy cutting wire, and that is the string adhesion. It offers great resistance. Even though it be cut well away from the parietal wall (which it is safe to do as it cannot contain lung), pain or the jumping phenomenon is experienced owing to the heat or an electric stimulus being conducted to the parietal insertion of the adhesion. The base, therefore, must be anæsthetised. Sometimes there are numbers of these adhesions. Each must be anæsthetised. This takes time. Each prick is felt. Oozing may occur from each prick; and when all is done the adhesion may be very difficult to cut owing to its resistance. All this can be avoided by using an electrocautery. If it is used a short distance from the pleura, no pain is felt. There is no danger from bleeding in this type of adhesion. The adhesion is severed in a few moments. For this reason I have had made a minute electrocautery which can be passed through the cannula, alongside the needle telescope, or rather in the groove between the flexibile shaft carrying the light and the telescope. A cable connects this to a small transformer which hangs on to the operating table and provides both the light current and the cautery current. The cautery can be pushed in and out and used at any desired distance from the end of the telescope. Thus a distant or close-up view can be obtained at will, and the best distance for working be secured. It is very easy to manipulate and has necessitated no modification nor further complication of the instrument. Cord adhesions can also be severed by this method the danger of bleeding being minimised, in the usual way, by keeping the cautery at a dull red glow. With large, broad, thick adhesions there are difficulties from smoke, smell, and bleeding if the electrocautery is used; these should be eliminated by the use of the diathermy current.

To summarise: for string adhesions, division by electrocautery appears to be the best method; for large adhesions, diathermy. Whether to use one instrument or two—that is to say, whether to do everything through one cannula, involving one puncture only, or through two cannulas—seems to depend on visibility and ease of access to the parietal insertion of the adhesion. Other things being equal I believe the one instrument method to have a number of great advantages. If the work can be done quite well through one puncture, why make two?

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[1] THE LANCET, 1930, ii., 74.
[2] Ibid., p. 72.

PROPOSED TUBERCULOSIS HOSPITAL FOR EAST GLAMORGANSHIRE.—Dr. T. W. Wade, of the Welsh Board of Health, recently held an inquiry at Cardiff into the proposal of the Welsh National Memorial Association for the erection of a new tuberculosis hospital at Hayes Farm, Sully. The medical committee of the Association recommended that two hospitals should be provided, one for Swansea and the western side of Glamorgan, and the other to meet the urgent demands of Cardiff, East Glamorgan, and the adjoining area. It is calculated that the capital expenditure on the hospital during the next two years would be £125,000, exclusive of expenditure on land. The number of beds it is proposed to provide is 250 with future extensions to 300 or 350. The inspector will make a report to the Ministry of Health.

CLINICAL AND LABORATORY NOTES

THIRTY-EIGHT YEARS WITH A FRACTURED SPINE.

BY DOUGLAS GREEN, M.B. LOND., F.R.C.S. ENG.

THE unusual length of the period of survival after sustaining a fracture of the spine seems of sufficient interest to warrant publication. Perhaps some of your readers can answer my contention that the case is unique. During my student days it was generally taught that the maximum expectation of life after such an injury was two years, while the average was much shorter. Only recently I treated another man who lived over 12 years, after being thrown from his horse and sustaining a fracture of the spine through the twelfth dorsal vertebra.

The present case was somewhat similar. On August 8th, 1892, a telephone linesman, then aged 21, fell from a high telephone pole and fractured his spine between the eleventh and twelfth dorsal vertebræ, After a stay in hospital he was sent home and was attended by my predecessors in this practice. On my first making his acquaintance he was living in a spinal carriage with complete paralysis of both legs and lower abdominal muscles. Contraction of the muscles had taken place with the result that the legs were stiff, the hips being in normal position to the body in the supine position, the knees extended, and the ankles and feet in extreme talipes equino-varus with large corns over the external malleoli from friction of the bedclothes. Nursing was carried on by his sister, some eight or nine years older than himself, and no bed-sores appeared in the whole period he was under my observation. Naturally he had incontinence of urine and fæces and suffered from cystitis. He washed out his bladder daily with a weak solution of Condy's fluid, using an ingenious syphon arrangement attached to an ordinary rubber catheter.

Twelve months ago a perinephritic abscess appeared in the right loin. This was incised without the necessity of an anæsthetic and has since discharged urine and pus through a small sinus, urine also draining per urethram. Death finally ensued on March 9th, 1931, through renal insufficiency due to pyelonephritis secondary to cystitis, the man then having just reached his sixtieth birthday.

Sheffield.

RECURRING HERPES GENITALIS IN THE MALE.

ÆTIOLOGY AND TREATMENT.

BY J. AVIT-SCOTT, M.D. BIRM.,
HONORARY DERMATOLOGIST, MIDLAND HOSPITAL, BIRMINGHAM.

RECURRING herpes genitalis in the male is one of those minor ailments which besides being a great nuisance to its unfortunate owner, opens the door to much more serious infections like syphilis and soft chancre. The diagnosis is quite easy, and the disease so common that no full description is needed. When seen early the lesions, which are generally found in the balano-preputial groove, appear as a cluster of small rounded vesicles, the size of a pin's head and containing a clear fluid. Later they appear as a cluster of shallow circular erosions which are not indurated if they have not been irritated by caustics or other forms of unsuitable local treatment. The lesions are rather *irritating* and slow to heal considering their small size, but the irritation is as a rule most intense for a day or two before the vesicles appear. The consensus of opinion is that the condition is due to a filter-passing virus, and its frequent association with chronic venereal conditions of the genital tract, which had been noted by Doyon and Diday, suggested to me a method of treatment, and after effecting a cure in 12 cases I am of the opinion that in the majority of cases the condition is due to the presence of septic foci in the prostate.

I had noted during the war in France that prostatic massage in cases of chronic prostatitis often brought about an attack of herpes genitalis in patients, whether they had previously suffered from the condition or not, and I noted also that the cure or improvement of the prostatic condition led to an apparent disappearance of the herpes. Herpes genitalis often follows extra-conjugal intercourse or excessive coitus, which may be the equivalent of a powerful prostatic massage and shake up the infected foci. I do not know if excessive coitus or massage of the prostate releases a filter-passing virus which acts on the nerve-endings in the balano-preputial groove, but the following line of treatment has proved successful in these cases.

In all cases of recurring herpes genitalis, whether they suffer from a gleety discharge in the morning or whether they have threads in the urine or not, my procedure is as follows:—

(1) The possibility of stricture is settled by passing Nos. 7, 8, 9, 10, 11, 12 gum elastic bougies; if there is a stricture it may take several weeks to reach No. 12, and during this period hexamine. grs. 10 with tr. hyoscyamus ♏xx. three times a day before meals, is given in a small tumblerful of water.

(2) When a free flow of urine has been established the prostatic massage is commenced, which must be gentle at all times, but especially at first when the prostate may be acutely tender. The patient is instructed to hold his water for two hours before coming to me, when he is asked to pass a few ounces of urine in a conical glass, and the state of affairs in a case of threads or gleet is noted—then massage is performed gently on a bladder still partly full, after which the patient is instructed to empty his bladder completely.

(3) After the third prostatic massage which is repeated at intervals of a week, I begin instillations with weak solutions of silver nitrate. The patient after massage empties his bladder and by means of a small flexible acorn catheter size about 7 or 8 (French) fitted on the nozzle of a 1 c.cm. hypodermic syringe and the whole apparatus filled with the solution, a few drops of the silver solution in instilled in the prostatic urethra and also along the anterior portion of the canal. It is generally quite safe to start with a 1 in 3000 solution of silver nitrate. If the patient does not experience any undue desire to micturate after this and is able to hold his water for two hours or so, the next time I generally use a solution of 1 in 2500 and so on up to 1 in 500 if necessary, but 1 in 1000 which may be repeated several times is generally the maximum strength required. This is the treatment of prostatic gleet, and a very successful one too, if it is remembered that

no force is required in massaging the prostate and that instillations with strong solutions of silver nitrate do more harm than good.

After three or four weeks of treatment by massage followed by instillations one finds that the prostate, instead of being tender all over, is only tender over certain areas and then I massage gently over those spots which the patient indicates to me. The local treatment of recurring herpes genitalis consists in not irritating the lesions; the parts should be cleaned with warm water, dried carefully, and dusted freely with pure talcum powder. During the treatment of two cases I had curious experiences. One patient developed a typical eruption of herpes zoster affecting the left buttock and left thigh down to the knee, and as this form of herpes is considered to be of a different nature than the one we are now considering, the occurrence was probably a curious coincidence. The second patient was relieved from a mild but generalised pruritus of over 12 months'standing which I intended to deal with at a later date.

As a dermatologist I attach more importance to a prostate which feels what may be called normal, and is free from pain and lumps on massage, and to the absence of heavy sinking threads in the urine than to the presence of a few pus cells and a few fine floating threads in the urine, which may be due to a superficial catarrhal inflammation of the mucous membrane, as a rule clearing up completely in a month or two in the absence of over-treatment.

MEDICAL SOCIETIES

OPHTHALMOLOGICAL SOCIETY.

ANNUAL CONGRESS.

THE annual congress of the Ophthalmological Society of the United Kingdom took place at University College, London, from April 23rd to 25th, under the presidency of Mr. LESLIE PATON. Among numerous papers contributed was one on

Non-luetic Argyll Robertson Pupil

by Mr. R. FOSTER MOORE. It recorded eight additional cases since his paper on the subject in 1924. Twelve of the total 15 cases were in females, so the condition could be said to be commoner in the female than in the male sex. He could not be definite about age incidence, since a number of the cases were discovered quite by accident, some had not been known to the patient, and in none was the date of onset accurately known. Some might be congenital, though in only one case was it suggested that the condition had been present ever since birth. The ages of onset given ranged from birth to 42. In 14 cases the fundi were examined with the aid of a mydriatic, but in none was any important abnormality discovered. The visual acuity did not seem to be affected; in 14 cases it was 6/6 in each eye after correction. The condition was usually unilateral and the pupil might be described as semi-dilated. It was practically inactive to the light stimulus, whether direct or consensual. Contraction occurred with convergence, but the rate of such contraction varied much, as also did its completeness. There was always a slow relaxation. Accommodation was not paralysed, and Mr. Foster Moore did not think the ciliary muscle was involved. It was important, he said, to discover whether these pupils bore any relation to syphilis in the patient, or whether any general nervous disorder coexisted. In none of this series was there a history of syphilis, or discovered syphilitic lesion. In two cases there was a slight drooping of the upper lid.

Leber's Optic Atrophy.

Dr. RITCHIE RUSSELL (Edinburgh) read a paper on Hereditary Aspects of Leber's Optic Atrophy. This disease, he said, did not seem uniformly to follow the rules of inheritance of a single recessive character. In Leber's disease an affected male rarely had affected grandsons. The mode of inheritance was not the same in the various sex-linked diseases, and in some strains at least an accessory factor was concerned in their development. Dr. Russell's paper dealt with four cases in the same generation in a family living in the Orkneys.

The first patient, a man aged 40, had loss of vision and pains in the legs. At first there was only slight dimness of vision after reading; it did not interfere with his work as a carpenter. Later he had severe pains in the right eye, which lasted a week, and with these pains the vision failed rapidly in both eyes. Coincidently he had pains in both feet, and they became swollen. Vision had improved but little. He had five healthy children. Higher cerebral functions were apparently undisturbed. Both the discs were blue-grey in colour; the edges were sharply outlined, and the lamina cribrosa was prominent. No changes were apparent in the maculæ or the periphery of the retinæ. The pupils were 4 mm. in diameter, circular, equal, and regular in outline. Ocular movements were full in all directions. Neither nystagmus nor diplopia was present, but the patient could not converge. No disturbance of muscle power, tone, or coördination was noted; neither was there any abnormality to light touches, to pain, or appreciation of passive movement.

The other cases were somewhat similar, with variations. Three cases in the generation followed a consanguineous mating; probably the original stock bore a trait of the malady. Perhaps a second factor, not sex-linked, and multiplied by the consanguinity, was concerned in the manifestation of the disease. Dr. Russell did not think this likely, but the consanguinity might have reduced the general vigour of the stock and so caused a dormant trait to become manifest again. Leber's disease showed no evidence of its presence until years after birth; and in this it stood alone in this group of diseases. It could be classed as an instance of inherited tissue vulnerability.

Mr. A. W. ORMOND read notes on

Ocular Symptoms in Osteitis Deformans.

The case he described was reported by Dr. Herbert French in 1920, and eight years later Mr. Ormond saw him because of his ocular condition.

The first complaint had been of pains in the right tibia, followed by pain and aching in all bones. A curvature of the radius was noted, and at a later stage there was pain in the head bones. He had not had typhoid fever, nor lived abroad, there was no history of syphilis, and he was an abstainer and non-smoker. Early in the illness he complained of a flickering to the right in his eyes, and he tended to move to the right instead of straight ahead. Vision in the left eye was defective; and he could not see with it unless he looked towards the ground. When Mr. Ormond saw him there were definite pathological changes in the fundus of the left eye involving the macular area. Vision of the right eye at that time was 6/6, but that of the left was less than 6/60, and there was only peripheral vision. A large choroidal hæmorrhage was seen, with much disturbance of retinal pigment. Later there was much failure of vision in the right eye, and similar changes to those in the left, the visual acuity being no more than 6/36.

This year the patient could not see 6/60 with either eye, and central vision was very depressed. In the right eye was a large mass of organising tissue in the macular area. There was also, in this neighbourhood, a scattered patch of probably old hæmorrhagic pigment. The left macular region was occupied by an atrophic area, with sclerosed and tortuous choroidal vessels; the arteries were small and attenuated. There were gross changes surrounding the optic disc. The hearing power was lessening.

It was clear, Mr. Ormond said, that the ocular defects which had been reported in association with Paget's disease were due to two separate conditions: (1) changes caused by the optic foramen pressing on the nerve and leading to changes in the fields of vision, with loss of visual acuity and the production of optic atrophy, &c.; (2) definite retinal and choroidal disturbance with hæmorrhages the result of widespread vascular changes which did not affect the nerve head at all. Many observers had found in the eyes of patients suffering from osteitis deformans a condition similar to that found in advanced disease consequent on inherited syphilis. Tubby had stated that the disease was probably a disorder of the perverted metabolic type. In one recorded case marked improvement followed a change from a partially carbohydrate to an almost exclusively protein diet. With the diagnostic aid of improved radiography the disease did not appear to be as rare as was formerly supposed.

The general weight of opinion seemed to be that a toxin or some chemical deficiency, acting through the blood stream and affecting the vascular system generally, was at the root of the matter. Most cases of long standing had some evidence of vascular changes, both in the fundus oculi and in the body generally.

Treatment of Detached Retina.

Mr. C. SHAPLAND contributed a paper on A Hundred Cases of Retinal Detachment Treated by Cautery Puncture. He said that in December, 1929, Sir William Lister carried out the first operation in Moorfields Eye Hospital according to Gonin's method for retinal detachment, and since then 100 cases had been so treated. This operation presupposed that a hole in the retina had been discovered, and an effort was made to occlude it by a cautery puncture. Fifty-six of the patients were males, 44 females, and the average age was 41½ years. Refractively considered, there were four groups: high myopes, low myopes, aphakics, and emmetropes. Thirty-two patients had a myopia of more than 5 D, 24 less than this, three had aphakic eyes, and in 41 the refraction was either emmetropic or slightly hypermetropic. Trauma (local or general) seemed to have been an ætiological factor in a small proportion of the myopic detachments, and a much larger proportion in the emmetropic group. In the 56 cases of myopic detachment, nine had a blow on the affected eye or adjacent part of the head immediately before the visual defect occurred. In a case of bronchitis the coughing seemed to have precipitated the detachment. In the emmetropic cases 16 gave a history of recent local injury.

Retinal holes could be put into five groups. The commonest site for a retinal hole was the periphery of the temporal half of the globe. Disinsertions showed a marked preference for the emmetropes; 66 per cent. of the rents were at the ora serrata, while they occurred in 25 per cent. of the low myopes, and only 9 per cent. of the high myopes.

Forty of the 100 cases were discharged from the hospital cured, and 17 others showed improvement, either in visual acuity or the area of the field. The average age of the cases cured—both sexes—was 34½. The average duration of the detachment, from the time of onset of the visual symptoms in the affected eye to the date of admission to hospital for operation, was seven weeks, the longest duration after which a successful result was attained being 12 months, and the shortest, seven days. In the aphakic group no successful result was obtained. The round-hole cases afforded the best prognosis, 53 per cent. of these being cured; disinsertion cases gave 49 per cent. of cures. Of the 40 primarily successful cases, recurrence of the detachment took place in 11, the interval varying between a week and eight months. In 30 of the total cases the restoration had remained in situ—for 15 months in the earlier cases.

Vitreous hæmorrhage at the seventh to tenth day after operation was the worst sequel when the Paquelin cautery was used, but after this was supplanted by the electric thermo-cautery this complication had been practically absent. There were four cases of fairly severe uveitis, two of traumatic cataract, and two of subretinal hæmorrhage. No eye in the series was lost through panophthalmitis.

The PRESIDENT spoke of the importance of this treatment for what had formerly been looked upon as a very hopeless condition, so that ophthalmic surgeons were taking up this line of attack with great hopes of success. Yet in early days successes could be recorded. In 1906 he operated upon a lady for a detachment which caused blindness in the eye, and the last time he saw her, 24 years later, she was seeking a licence to drive a motor-car. Another patient, whose vision had been reduced to mere perception of hand movements, shot, some time after the operation, 22 partridges and a rabbit with 24 cartridges.

Mr. FRANK JULER mentioned a series of his own cases of detachment which he had treated by the Gonin procedure. He had had 32 per cent. of cures. One case was that of a man aged 50, whose vision before the operation was reduced to hand movements on the temporal side. After the Paquelin cautery applications both the field and the vision were improved at once. The retina was in place up and in, but was still detached below. Another small hole was detected in this area, and eight and a half months after operation the retina was in place throughout, and the visual field was full. The other case was one of bilateral detachment of old standing in a man aged 27. Operation resulted in a vision of 6/24 in the right eye, 6/5 in the left, the fields were full, and the retinæ firmly fixed.

Chronic Blepharitis.

Mr. M. S. MAYOU submitted a contribution on Treatment of Chronic Blepharitis with Vaccine. The condition, he said, varied in severity from the seborrhœic type—in which a small amount of discharge stuck to the lids, with a slight desquamation of the epithelial cells at the lid margin—to severe ulcerative blepharitis with destruction of the lid margin, hair follicles, glands, &c., and thickening due to the chronic inflammation of the lid. The milder forms were easily remedied by using the customary staphylococcal vaccine and the local application of lotions and ointments such as yellow oxide of mercury and resorcin. His purpose was to speak of the treatment of the more chronic type, which gave rise to trichiasis and tylosis, with eversion of the puncta and ectropion. Infection of the conjunctiva was always present. In the first instance the infection was staphylococcal, derived from the glandular secretions of the lid margin, but, sooner or later, there was usually an infection with the Morax-Axenfeld bacillus. Usually there was an accompanying eczema of face and head. It was important at the beginning to get rid of any source of septic infection, such as tonsils, or to deal with discharging ears, and to give appropriate tonic treatment, with sunlight, cod-liver oil, and, if necessary, glasses. Considerably improved results ensued at the Swanley institution by injecting a mixed vaccine of staphylococcus and Morax-Axenfeld bacillus into the eyelid. It was of the strength of 500 million to 1 c.cm. of each organism. If cases did not respond to this, they did to an autogenous vaccine. The treatment was continued once a fortnight until a cure ensued. When patches of ezcema were associated with chronic blepharitis, injection of vaccine under the patches had often cleared up those areas, even when they had existed for years and had not yielded to any other form of treatment.

One session was set apart for a discussion on

Affections of the Eye Due to Viruses.

Dr. J. R. Perdrau, in opening, said that the terms ultramicroscopic and filtrable were not applicable to viruses as known to-day. So long as the agent responsible for a disease remained undiscovered, it could not be spoken of as the virus of that disease. He entered into a consideration of the better known characters of viruses, and a comparison of them with visible bacteria. The mere fact that the causative agent of any particular disease passed through one of the filter candles in common use did not justify its inclusion among the viruses, at least until the conditions of filtration had been standardised. Certain virus diseases were characterised by the presence of inclusion bodies in one or more organs or tissues. Some, such as the Negri bodies of rabies, were highly characteristic, and important for diagnostic purposes. Inclusion bodies had been produced in the rabbit's cornea by physical agents, such as ultra-violet rays. An important negative character of viruses was that, up till now, it had been impossible to cultivate them on lifeless media. There was often a close association between viruses and the cells of the tissue or organ in which they multiplied in the living animal. This had proved to be a very important factor in the experimental study of viruses, particularly in regard to problems of infection and immunity in their broadest sense. Dr. Perdrau proceeded to speak in detail of the study which had been made in regard to the viruses of vaccinia and herpes; also on species specificity and tissue specificity in relation to immunity.

Mr. F. T. Ridley devoted his attention to some diseases of the eye which were known to be due to viruses, with some reference to the viruses which attacked the eyes of animals. The virus of vaccinia inoculated on the cornea of a rabbit caused a lesion similar to the vaccinial pustule on the skin. Hypopyon was frequently seen. The acute condition subsided, leaving opacity of the substantia propria and permanent scarring. There was a generalised immunity to reinfection with the virus of vaccinia. In herpes febrilis keratitis the lesion started as a localised opacity in the substantia propria. This might so spread as to involve the whole cornea. Perdrau's virus, obtained from lungs of patients dying of pneumonia, produced very severe keratitis, usually involving the whole cornea. It was accompanied by great vascularisation. Mr. Ridley spoke also of dendritic ulcer, which, he said, might arise in several ways. In many cases it arose in association with malaria, and in these it was relieved by administering quinine.

Mr. F. A. Williamson-Noble thought that in the case of the herpes virus infection a very important factor was the resistance of the patient or the local resistance of the part affected. As to the pathology of herpes zoster, Head and Campbell's description in 1900 still held good. The virus caused an acute inflammation in the Gasserian ganglion, and this was accompanied by hæmorrhage, the eventual condition being a fibrosis, with thickening of the overlying sheath. In severe cases the virus spread so as to implicate other nerves. Treatment was mainly symptomatic, but Friedenwald had reported the result of treating such a case with convalescent serum. Coincident iritis proved to be resistant, but eventually the vision rose to 6/9. Speaking of sympathetic ophthalmia, which Mr. Williamson-Noble thought might be due to virus infection, he said that Sommer had described two cases of sympathetic ophthalmia following herpes zoster, though in both those patients there was perforation of the globe. Both eyes showed the histological changes of sympathetic ophthalmia. Szily had stated that the clinical picture produced by the herpes virus suggested that sympathetic ophthalmitis might be caused by a virus, so far undiscovered, which passed from one eye to the other by means of the sheaths and chiasma of the optic nerve. If this were true it was important when considering the question of removal of the exciting eye; the optic nerve should obviously be severed, and as far back as possible.

Dr. L. H. Savin spoke of two cases in which he thought a virus was responsible for the activation of other organisms. One was a case of cavernous sinus thrombosis which followed nine days after injection of a vaccine for rheumatism. The patient had swollen eyes and face and a temperature of 105° F.; a blood-stained fold of conjunctiva protruded between the right lids, and both eyes were blind. The blood showed 20,000 whites, 90 per cent. being polymorphs, and 8 per cent. lymphocytes. There was a complaint of headache and pain over the eyes. Cavernous sinus thrombosis was diagnosed, and on the fifth day of the illness the boy died. Streptococci were isolated from pus at the base of the brain. He was probably, as shown by his rheumatism, specially sensitive to streptococci.

Mr. Humphrey Neame spoke on keratitis in dogs in association with distemper and other conditions, and the discussion was further continued by several members.

Air Vice-Marshal Sir David Munro read a paper entitled

Vision in Sports and Games.

The visual factors, he said, were not the only ones concerned in proficiency in games; good muscular coördination and kinæsthetic sense were as necessary as good visual judgment. Instructors should not attempt to train on the motor side until the perceptive side had been investigated, the latter to include the causes of faulty visual judgment. There was a tendency to instruct to a set pattern, apart from personal peculiarity. He classified sports and games into: (1) those in which the player had to follow with both eyes the flight of an approaching or receding ball and to judge its pace; (2) games, such as golf and billiards, in which the ball had not to be followed, but a stroke had to be timed and executed with delicacy; (3) shooting sports, in which the flight of an approaching or receding object had to be followed with both eyes, and accurate timing carried out; (4) the monocular sport of shooting with a rifle at a target; (5) rifle shooting at a moving target; (6) motoring and flying, in which the judgment required was that of one's own pace. The chief visual judgments to be made in games concerned pace, space, and place.

There was a good deal of evidence that imperfect ocular balance was important in causing deficient following of a moving object binocularly, so causing erroneous judgment of distance. The speaker concluded his paper by saying that if he were intending to specialise as a teacher of ball games he would rely on his amblyoscope and stereoscopic charts for correcting the chief sources of visual error.

Papillœdema.

Mr. EUGENE WOLFF (in collaboration with Mr. FRANCIS DAVIES) read a report of work carried out in the Anatomy Department of University College, London, on the Pathology of Papillœdema. The conclusions arrived at were: (1) Non-diffusible dyes injected into the cranial subarachnoid space, at pressures which are compatible with life, do not enter the optic nerve. (2) Claims to have produced papillœdema by injecting fluids into the subarachnoid space at pressures compatible with life were not upheld by this study. Structural reasons were advanced for the special site of commencement of papillœdema in human beings, and for the extent of the distribution of the œdematous fluid associated with papillœdema.

LONDON JEWISH HOSPITAL MEDICAL SOCIETY.

A MEETING of this society was held at the London Jewish Hospital on April 16th, with Dr. LEOPOLD MANDEL, the President, in the chair.

A paper on modern advances in the

Diagnosis of Intracranial Tumours

was read by Dr. GORDON HOLMES. As tumours might occupy any region of the brain, he said, all possible signs of neurological disorder might be produced. Localisation was always interesting, for it could be checked by the surgeon. Treatment had not advanced in the same way as diagnosis and localisation, for 60 to 70 per cent. were gliomata, or spreading tumours, and therefore difficult to extirpate surgically. Herein lay a possible advance in treatment by X rays or radium. The diagnosis of tumour was made by the presence of increased intracranial pressure, evidence of local disease, and symptoms of irritation. Increase of intracranial pressure was brought about either by the size of the tumour itself in the closed cranial cavity, by reactionary changes around the tumour (especially malignant metastases), or by interference with the circulation either of blood or cerebro-spinal fluid. Headache, vomiting, and optic neuritis were the classical signs, but any two of these were sufficient to make one strongly suspect its presence. The diagnosis became certain, when besides increase of pressure there was disturbance of function (depending on the site of the tumour) pointing to local disease; this was usually of slow and gradual development. Irritative phenomena might take the form of local epileptiform seizures, of which tumour was the commonest cause. These sudden disturbances might be brought about either by reaction around the tumour, hæmorrhage into the tumour, or extension involving new structures, or obstruction of the flow of cerebro-spinal fluid—e.g., in the aqueduct of Sylvius.

The signs of cerebral tumour must be differentiated from those of: (1) primary degenerative changes, where there was no rise of pressure, and the lesion was diffuse and bilateral; (2) chronic uræmia, which could be diagnosed from an examination of the urine, blood-vessels, and blood pressure; and (3) cerebral arterio-sclerosis. The mathematical accuracy of localisation was interfered with by disturbances of other parts of the brain by such factors as displacement and the increase of pressure, but in spite of this, by clinical methods alone 80 to 90 per cent. could be localised. Dr. Gordon Holmes drew special attention to disturbances of sensation and of vision with tumours of the forebrain. There was no marked disturbance of cutaneous sensation, but discrimination was affected—that is, the sense of position of the limbs, stereognosis, and the recognition of simultaneous contact of two points in the compass test. As regards visual sensation, there might be gross disturbance of the fields, such as homonymous hemianopia, but on careful examination other disturbances might be found—e.g., visual inattention on the simultaneous exhibition of two objects (in superficial lesions of the parietal and occipital lobes), or visual disorientation (especially in lesions of the left side of the brain).

Recent advances in aids to localisation had proved of little true value. X rays were occasionally useful, but the interpretation of the skiagram was difficult. Pneumo-encephalography was attended by an 8 per cent. mortality, and the more careful the clinician the less use there was for this method. Injection of the carotid artery with sodium iodide solution was dangerous. Auscultation of the skull with the ear, by the presence of a murmur might reveal a vascular tumour or aneurysm; whilst percussion over the skull might reveal a tender area over the tumour. The important point to be remembered was that time and repeated examinations may be necessary before the tumour could be definitely localised.

Mr. JULIAN TAYLOR read a paper on the results of the

Surgery of Intracranial Tumours.

Compared with many other branches of surgery, intracranial operations presented a high mortality, a depressing proportion of complete failures, and of cases where only some of the symptoms were relieved. In contrast there was a small proportion where complete success was attained and a larger where disease was arrested and patients returned to nearly normal health. The variability of the results and the undoubtedly high proportion of failures and partial failures, was to be accounted for by the large number of conditions for which cranial operations were undertaken and by the complexity of their effect on the brain. Percentages were useless in estimating the prospects of a particular case, and to make a prognosis the following seven questions must be answered:—

1. Is the tumour of such a nature that it can be removed by operation or destroyed by irradiation?—Most intracranial tumours were malignant infiltrating neoplasms not associated with secondary growths. Some 60 per cent. were gliomas which infiltrated the brain but not its coverings. Their malignancy varied and their growth might sometimes be completely arrested. Only a very small proportion appeared to be amenable to treatment by irradiation at the present time. Some 12 per cent. were endotheliomas ("meningiomas"), which displaced the brain but infiltrated its coverings. Their malignancy was practically constant and their infiltration was so slight that in practice it might almost be neglected. The remainder were for the most part benign—pituitary, acoustic, congenital, and angiomatous tumours.

2. Is the tumour neurologically localised with sufficient accuracy?—A very high pitch of accuracy could be reached, but certain knowledge either of position or of size was not necessarily available.

The visual means by X rays, with or without air injection, lagged far behind.

3. Is the tumour in an accessible place and is it wholly accessible?—Examples of tumours at present partly accessible were subcortical tumours growing deeply towards the corpus collosum or basal ganglia.

4. Has it already destroyed the neighbouring brain so as permanently to abolish function?—Most intracranial tumours, when they presented themselves for operation, the neurological signs and symptoms were due more to temporary vascular effect of the growing tumour than to actual destruction, so that removal of a tumour or decompression might result in recovery from symptoms. The visual paths and cortex were exceptions and rarely showed signs of recovery.

5. Has the tumour already caused so great a rise of intracranial pressure as to make removal extremely difficult, extremely dangerous, or impossible?—In spite of the high level attained by neurological diagnosis, a large number of cases presented themselves with high intracranial tension which placed the greatest difficulty in the way of surgical relief. Methods were available for mitigating this danger. Where papillœdema had resulted in atrophy, return of vision was not to be expected.

6. Are there difficulties special to the tumour?—There were difficulties special to most tumours—e.g., tumours in the neighbourhood of the left Sylvian fissure or of the left motor cortex were rarely susceptible of removal on account of aphasia and right hemiplegia. Tumours in the posterior fossa were dangerous on account of hæmorrhage from cerebellar vessels and of the proximity of the medulla, which prevented any but the slightest manipulation.

7. In the likely event of an unfavourable answer to any of the six preceding questions, is a measure of relief possible or can palliation be achieved?—For decompression to produce relief, it must be over the tumour. Where there was hydrocephalus, decompression might give little relief, especially in the posterior fossa. The site of obstruction to the cerebro-spinal fluid pathway, whether on its outward or return flow, was an important factor in the posterior fossa. Decompression either above or below the tentorium was rarely beneficial in tumours obstructing the incisura tentorii.

Mr. Taylor concluded by giving a short résumé of results in glioma, endothelioma, pituitary, acoustic, and hæmangiomatous tumours. In gliomata the results were doubtful—i.e., variable. In endothelioma the progress depends on size and length of time preceding the increase of intracranial pressure; recurrence in the coverings was unfortunately too frequent. Pituitary tumours in some cases could be successfully operated on, but deep X ray therapy seemed to hold some hope. More knowledge of this form of therapy was awaited. Diathermy in the removal of some growths had met with success.

The PRESIDENT said that members of the society, having heard the two speakers, would in future approach cases of growth of intracranial cavity with a little more optimism than hitherto.

Mr. H. S. SOUTTAR pointed out that the symptoms displayed by the patient were often quite out of proportion to what was found at operation. A very small tumour might give rise to an immense hydrocephalus, whilst on the other hand he had had a case in which a huge tumour of the parieto-frontal region caused no symptom except extreme cheerfulness.

Dr. M. SCHWARTZMAN gave details of a case of pituitary tumour alleviated by radium.

Mr. S. I. LEVY recorded a case of cerebral sarcoma, treated by radium after decompression; the patient had lost his symptoms and was now carrying on a normal life.

Dr. GORDON HOLMES, in reply, thought there was a future for X ray therapy in certain types of tumours. With radium, the results at Queen-square had so far been disappointing.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

AT a meeting of this society at Liverpool, on March 20th, Mr. ST. GEORGE WILSON read a paper on

Lower Uterine Segment Cæsarean Section.

He reported the result of 50 of the 54 cases of which full details were available and in which he had used this incision. Twenty-three patients were primiparæ, 27 multiparæ, and 15 had had previous Cæsarean sections. In 22 of his cases there was general contraction of the pelvis and in 14 flat pelvis. There was one case of oblique contraction and one of disproportion, which Mr. Wilson agreed with Mr. Leyland Robinson in ascribing mainly to deflection of the head due to or associated with imperfect functioning of the uterus. Pelvic tumours were present in four cases. In two cases operation was done on account of cardiac condition. The remaining five comprised three patients with bad obstetrical histories, one with prolapse of the cord, and one elderly primipara with a breech presentation and rupture of the membranes of four days' duration.

The lower uterine segment incision, said Mr. Wilson, extended the indications for operation. He thought that it also tended to diminish the number of operations performed. The text-book measurements of the pelvis were, he thought, well above normal and a large number of cases labelled "generally contracted pelvis" would deliver themselves if given the chance of a trial labour. His operation-rate at Walton Hospital was 1 in 14·3 deliveries. The average duration of labour in his 50 cases was 15·3 hours, the period of labour allowed being regulated by the condition of the fœtus alone. The longer the labour the simpler the operation. Reported cases showed that the morbidity-rate was greater in classical than lower segment Cæsarean section. The speaker agreed with Munro Kerr that the uterine wound was infected from the interior by an ascent of bacteria from the vagina. In his own series, excluding six cases of pulmonary condition and one of pyelitis, five were notifiable under the pyrexia Act, a morbidity-rate of 10 per cent. The average stay in hospital was 19·4 days.

Besides its immediate importance, he considered that sepsis had a bearing on future pregnancies and labours. He thought, however, that the situation of the placenta over the previous scar was the important ætiological factor in five of the six cases of rupture he had reported to the society. It was stated that the placenta was attached to the anterior wall in 40 per cent. of pregnancies. Apart from the absence of placental attachment, the lower segment had the advantage that it bore no stress during pregnancy or early in labour when rupture was most likely to occur in the classical scar.

Among the children there was one stillbirth, a hydrocephalic with spina bifida, and two neonatal deaths, one soon after delivery, the other at ten days from gastro-enteritis.

A film of the operation was then shown and described. A catheter is kept in the bladder till the patient was put on the table. The position used is a moderate Trendelenburg.

The abdomen is opened by a mid-line subumbilical incision and a large Doyen retractor introduced. After careful packing off, a curved transverse incision is made as low down as possible in the utero-vesical pouch. The bladder is not pushed down and a similar curved transverse incision is then made through the lower segment, the lateral extensions of the incisions being made with scissors. Pressure on the fundus forces the head down and delivery is assisted by means of one blade of Simpson's forceps used as a vectis. Traction on the head then completes delivery. The placenta as a rule separates at once and is delivered by traction on the cord. At this stage an injection of ergotamine phosphate and histamine is given intramuscularly. The incision is then closed by continuous catgut sutures in two layers, the decidua being avoided and the cut edges inverted. A third continuous suture closes the peritoneum. Graf's No. 3 catgut is used throughout.

Mr. Wilson said he had never left the placenta to be delivered per vias naturales. In conclusion he referred to the easy convalescence of these cases, the absence of intestinal complications, and the advantage of confining any infection to the pelvis and behind a loosely attached peritoneum rather than allowing it to spread through the adherent upper-segment peritoneum to the higher parts of the abdominal cavity.

Prof. Blair Bell showed a uterus with attached portion of colon removed at operation for a uterocolic fistula due to carcinoma. He also described a case of intra-uterine pregnancy occurring after conservative operations for different lesions first on one tube and later on the other.—Prof. Blair Bell and Mr. Leyland Robinson each described cases of fibromyomatous uteri simulating pregnancy.—A specimen of torsion of a hydrosalpinx was demonstrated by Mr. N. L. Edwards (Derby) and Mr. St. George Wilson showed a uterus which had spontaneously ruptured during unassisted delivery of the child.

LIVERPOOL MEDICAL INSTITUTION.

At a meeting of this institution on April 16th, with Prof. W. Blair Bell, the President, in the chair, a discussion on the care of

The Child from Birth to School Age

was opened by Dr. Leonard Findlay (London). Although infant mortality had improved considerably during the last 30 years it still remained, he said, a very serious problem. Until 1913 the death-rate was higher in England than in Scotland, but since then the reverse had been the case. One of the chief reasons for this reversal was the relative disappearance of epidemic enteritis, which was always more severe in England owing to climatic conditions. However, the simultaneous fall in deaths from this cause in various towns in Britain, Europe, and America suggested that the disappearance was in response to natural laws rather than as the result of any human efforts. Measles and whooping-cough were responsible for a large proportion of infantile deaths, and he suggested that one method of combating these diseases would be the provision of housing accommodation in order to lessen the density per unit area of the population, thus decreasing the opportunity for the spread of the infection. He agreed that the relatively more rapid fall in the infantile death-rate in England might be partly due to the intensive child welfare movement there, and quoted the fact that in England the deaths from convulsions and debility had fallen 200 per cent. since 1911, whereas in Scotland the fall amounted to 25 per cent. at the most. He emphasised, however, that there must not be too much supervision, or at least ill-directed interference with nature—a prevailing state of affairs as suggested by the rise in deaths from injury at birth, and rendered still more probable by the simultaneous increase in maternal deaths. Between birth and school age environmental conditions exerted their greatest effect. Tuberculous infection was then most prevalent and deaths from tuberculosis were more numerous during the first year than during any single year thereafter. It was difficult to estimate the amount of tuberculosis contracted during early life, for often it did not declare itself until later, but it was known that much of it was due to the bovine tubercle bacillus transmitted by milk, and consequently preventable. He urged, therefore, that no efforts be spared to secure a pure milk-supply. The provision of tubercle-free milk must apply to rural districts as well as to the large cities, for there was good reason to believe that bovine tuberculosis was relatively more prevalent in rural districts and small towns.

Dr. Norman Capon quoted figures to show that, in spite of the gratifying reduction in the infantile death-rate during the present century, there had been only a slight fall of mortality-rate during the first four weeks of life. Every new-born baby still passed through a period of great danger to life; and when he survived he might have suffered damage which would jeopardise his future. It was an appalling fact that 47,868 infants died in England and Wales during 1929 before they reached the first anniversary of their birth, and that 21,136 of these babies did not survive the neonatal period. During the same year the total maternal deaths numbered 2787. Close coöperation was needed between obstetricians and pædiatricians. The former were in a position to employ prophylaxis when it might reasonably be expected to be most fruitful. It could be divided—to quote Eardley Holland's happy phrase—into the strategy of obstetrics (antenatal supervision) and the tactics of obstetrics (conduct of the labour).

Dr. H. R. Hurter said that the healthy child of 4 or 5 needed better exercise than the long monotonous walks alongside the perambulator of his younger brother; outdoor games and the garden sand-heap were favoured. He thought the incidence of measles amongst Liverpool's middle classes would be lessened if the annual civic children's party were held in May or June instead of in January. Dr. Hurter said that acidosis had become too fashionable a diagnosis. Parents had now the same dread of this word that the whole nation had of the term "blood pressure" less than a generation ago.

Dr. A. Dingwall Fordyce said the modern conception of medicine was wide, and so far as the care of the young child was concerned could be considered as composed of purely physical care and of mental care, with the very important inclusion of wholesome neglect. The object in early years must be to preserve normality, and rational care must be under medical supervision. A unified medical service was necessary, and in order that such service be capable and reliable undergraduate instruction in pædiatrics must be developed.

The President said that he had long been of the opinion that obstetricians should surrender the care of the child from the hour of birth to the pædiatrician. During the last 20 years he had himself seen a great change in obstetrical interest in the life and freedom from injury of the child. Whereas formerly the baby received scant consideration, now, while the interests of the mother still had, and always would have, a prior claim, the life of the child was always taken into consideration of the best method of delivery.

He was, therefore, somewhat surprised to hear Dr. Findlay state that the percentage of birth injuries had been doubled. He thought this statement was not strictly true, and was probably due to the fact that the frequency of fatal intracranial hæmorrhages was not realised until a few years ago. Pædiatricians were responsible for the production of the healthy mothers of the next generation. The reduction of the maternal mortality depended largely on the prevention of contracted pelves, not only those due to rickets but also those, such as round pelves, due to postnatal developmental errors. So too the disappearance of infections, including rheumatism in juvenile life, would diminish the number of cardiac, renal, and arthritic maternal cripples.

REVIEWS AND NOTICES OF BOOKS

Fractures and their Complications.

By GEORGE EWART WILSON, M.B. Tor., F.R.C.S. Eng., F.A.C.S., Surgeon-in-Chief, St. Michael's Hospital, Toronto; Assistant Professor of Surgery, University of Toronto. London: Baillière, Tindall and Cox. 1931. Pp. 415. 35*s*.

THE routine use of radiography in the recognition and treatment of fractures has altered the clinician's attitude, and though it is still considered essential to impress upon students the signs by which to appreciate displacements characteristic of particular injuries, the surgeon is mostly concerned in diagnosis with X ray appearances. So it is with this author, whose book is thus adapted to the needs of the post-graduate rather than to those of the student. Nevertheless, the opening chapters, devoted to the morbid anatomy of fractures, their effects and processes of union, provide an attractive general exposition, and show the author to be a surgeon as well as the skilled mechanic that the later pages reveal. Frankly a personal work, the book describes Prof. Wilson's own methods with little reference to tradition or to the modern procedures of others, and it contains much which will stimulate controversy. The section devoted to cranial injuries properly emphasises the coexisting cerebral lesions, but the reference to the characters, prophylaxis, and management of the intracranial infections associated with fracture of the anterior fossa is so meagre as to mark an omission. In fractures of the limbs Prof. Wilson insists on the importance of fluoroscopic examination during reduction, an ideal not always to be reached in this country even in large hospitals. The treatment of the fractures of the upper limb is in accordance with the orthodox practice of the present day. The possibility of recurrence of deformity in Colles's fracture following premature relaxation of palmar flexion is duly noted, but we cannot agree that with fixation in flexion over-correction is impossible. The management of the femur here recommended is again orthodox, though no mention is made of the Thomas walking calliper during the early months of union. For the leg we should like to see some account of the ambulatory methods of Delbet, their indications and dangers, as an alternative to the prolonged plaster fixation recommended. The book is closely but well printed on clay paper and the illustrations are apposite, though the reproduction of the radiograms is not of uniform excellence.

Pye's Surgical Handicraft.

Tenth edition. By H. W. CARSON, F.R.C.S., late Senior Surgeon to the Prince of Wales General Hospital, Tottenham. Bristol: John Wright and Sons, Ltd. 1931. Pp. 641. 21*s*.

THIS latest edition of Pye was completely revised by Herbert Carson before his death and shows many signs of the thoroughness with which he always carried out his work. *As a guide* for house surgeons it remains unrivalled. Its usefulness is much enhanced by the collaboration of experts in certain of the specialties, though it seems unnecessary to procure a special description of the use of the Thomas splint, the great advantage of which is the simplicity of its underlying principles and application. We have tested the book from the house surgeon's point of view and find it likely to be helpful in almost any emergency and in most of those minor procedures which he is called upon to perform. In future editions help might be offered on the use of hypertonic magnesium sulphate in the treatment of head injuries, the dosage and details of administration of tetra-iodo-phenolphthalein, the preparation of the patient for sigmoidoscopy, the dosage of glycerin in an enema, the Dickson Wright treatment of varicose ulcer, the use of glucose saline and of insulin for shock, and the preparation of diabetics for operation. It is a great achievement for the editor to have freed himself from the trammels of tradition and arrangement and to have produced an edition which fulfills the requirements of the modern house surgeon as efficiently as did the original one when it was issued nearly 40 years ago.

Ultra-violet Radiotherapy.

By W. KERR RUSSELL, M.D., B.S., Medical Officer in Charge Light and Electrical Department, Miller General Hospital for South-East London. Modern Treatment Series. London: Jonathan Cape. 1931. Pp. 130. 5*s*.

IN a short note Dr. F. G. Crookshank, the general editor of the series to which this book belongs, states that the aim of these small volumes is to give practitioners an opportunity to obtain in convenient form and at small cost reliable guides to the present practice, and best opinion in some of the many branches of medicine and surgery. Considering the limitations of size imposed on him, and the difficulty of summarising a controversial subject, Dr. Kerr Russell has accomplished his task remarkably well. His exposition is lucid, dogmatic by necessity, but very accurate. The medical reader who is unfamiliar with the subject will not be puzzled by superfluous technical terms, and will not be irritated by the adoption of the "popular" style commonly associated with elementary manuals. More space could profitably have been allotted to physiological considerations and less to descriptions of apparatus. We question also whether a detailed description of the technique employed in treatments with the Finsen-Reyn lamp serves a useful purpose in a book of this scope. Anyone who might feel tempted to treat a case of lupus, for which this lamp is so frequently and successfully employed, after learning the very difficult technique in a book, will find that he has to learn all over again from his mistakes, a method not likely to benefit either the practitioner or the patient. Another omission in the introductory remarks is of some practical importance. Enumerating the type of cases which a biophysical assistant should not treat without direct medical supervision, Dr. Kerr Russell mentions pulmonary tuberculosis associated with hæmoptysis, but no other type of tuberculosis is specifically mentioned. All cases of tuberculosis, and more especially of phthisis, should be under direct medical supervision, and it is especially in the early or quiescent cases of pulmonary tuberculosis that irreparable damage can be done by injudicious light treatment. There are not many such omissions, and this small volume will be found informative and readable by both medical and lay workers.

Lectures on Diseases of Children.

Sixth edition. By Robert Hutchison, M.D., F.R.C.P., Physician to the London Hospital, and Hospital for Sick Children, Great Ormond-street. London: Edward Arnold and Co. 1931. Pp. 487. 21*s*.

A new edition of this work from which so large a number of students and doctors have obtained instruction and pleasure is always of interest, especially to those who have watched its evolution from a short series of well-chosen lectures to a volume which has achieved the completeness of a text-book and yet retained the characteristic style of the author's clinical teaching. In the sixth edition minor alterations have been made throughout the text; the lecture on the dyspepsias of childhood has been rewritten and a somewhat different classification adopted. Three new chapters have been added, dealing respectively with diet after the period of infancy, with asthma, and with chronic splenomegaly. The first of these adds greatly to the value of the book as a practical guide to routine work, and should act as a wholesome antidote to some of the faddy and pseudo-scientific suggestions with which the student is often beset. The lecture on splenomegaly provides a clear account of the difficulties of differential diagnosis in these conditions. This new edition will add to the influence which Dr. Hutchison's work exerts on the study of pædiatrics.

Clinical Nutrition and Feeding in Infancy and Childhood.

By I. Newton Kugelmass, M.D., Ph.D., Sc.D., Associate Attending Pediatrician, Fifth Avenue Hospital; Riverside Hospital; Director, Heckscher Institute for Child Health. London: J. B. Lippincott Company. 1930. Pp. 345. 25*s*.

The aim of this book is to interpret the science of nutrition for the benefit of the practitioner of medicine, or, as the author expresses it in the preface, "to temper scientific severity for clinical clarity." The result is that the practical problems of the feeding of infants and children in health and disease are presented as though no problems remained to be solved. Most of the paragraphs are preceded by a brief summary in heavy type of the argument that is to follow, and a selection of these headings will indicate the manner in which controversial subjects are treated. "Hypersensitiveness develops in utero as the result of the mother's over indulgence in certain protein foods." "Potential hæmorrhagic disease of the newborn may be prevented by prenatal feeding rich in protein and fat." "Acute intestinal intoxication in infancy is the result of an abnormal concentration of the blood." "Humanised dried milks are fool-proof feeding mixtures." It is true that much useful practical advice is contained in this volume, but it will scarcely appeal to those who believe that the science of nutrition has a future.

How You Work: An Introduction to the Human Body.

By Isabel Wilson, M.D. London: Gerald Howe, Ltd. 1930. Pp. 178. With 16 text-figures. 3*s*. 6*d*.

About 250 years ago Robert Boyle urged that it was "highly dishonourable for a reasonable soul to live in so divinely built a mansion as the body she resides in altogether unacquainted with the exquisite structure of it." If a child is a reasonable soul, we know of no introduction to the body and its working so well calculated to save him from a dishonourable ignorance. Whether young children—the wrapper mentions "8 years and upwards"—are quite reasonable enough is a question for pedagogues.

Clio Medica: Physiology.

By John F. Fulton, M.D., Sterling Professor of Physiology, Yale University. New York: Paul B. Hoeber. 1931. Pp. 141. $1.50.

Aristotle taught that animals live by virtue of their "innate heat." "The existence of life is coupled with the preservation of the heat aforesaid, and what is called death is the destruction thereof." It was some 2000 years later that Helmholtz proved that *muscular contraction is associated* with the evolution of heat, and by indicating the chemical transformations which produce this form of energy in the living tissues laid the foundations of biochemistry. It has been Prof. Fulton's task to indicate in broad outlines the main structure of physiological development in the space which separates these epochs. This he has done effectively; by tracing the history of knowledge with regard to the three great subjects of circulation, respiration, and digestion, and he has added a final chapter upon the rise of the modern laboratories and the trend of physiological research. He deprecates the tendency to pursue physiology too slavishly in the terms of the exact sciences and to lose sight of the great problems of integrated function in the fascinating and more exact bypaths of electrochemistry and biophysics. The production of a small readable handbook of this kind is a considerable achievement. The author has the gift of discretion and a sense of proportion. We have read the book with great pleasure and commend it to all those interested in the evolution of our knowledge of human function and, above all, to all students of medicine. We have detected only one inaccuracy. The author remarks that the Waynflete chair at Oxford, created in 1878, was the second chair of physiology to have been founded in Great Britain, Edinburgh having been the first. In this he is unfair to the University of Glasgow, which had, as early as 1832, a lectureship in the "Theory of Medicine" which was transformed into a chair of the "Institutes of Medicine" in 1839. The first occupant of the chair was Andrew Buchanan, who held it until 1876 when he retired under pressure, permitting himself in his valedictory address to explain to his students how a professor, who had no intention of retiring, might be got rid of *malgré lui*. Buchanan was succeeded in 1876 by McKendrick, when the title of the chair was changed to that of Physiology.

The price of "Physiological Chemistry," Fifth edition, by A. P. Mathews, published by Messrs. Baillière, Tindall and Cox, is 31*s*. 6*d*., not 15*s*. as stated last week.

THE LANCET.

LONDON: SATURDAY, MAY 2, 1931.

HOSPITALS AND PAY-BEDS.

THE plight of the voluntary hospitals is illustrated by the application last week to the Chancery Division for a scheme to increase the number of pay-beds in the Miller General Hospital for South-East London to 50. The board of management obtained the approval of the Charity Commissioners in January, 1929, to a scheme authorising the appropriation of not more than 15 pay-beds, for which a patient would be charged not more than £7 a week. The whole income of the hospital is derived from voluntary subscriptions, donations, and legacies, and from grants from King Edward's Hospital Fund. In 1929 the total income (including legacies) was under £35,000, as against expenditure of over £38,000. The deficiency of £3781 for 1929 has been estimated as likely to rise to £6394 for 1930. The board of management is able to make the point that the district of Greenwich and its environs has greatly changed its character, and now contains few inhabitants of more than small or moderate means; it is not anticipated that the annual subscriptions and donations can be kept up at the present level. In these circumstances the Charity Commissioners were asked to sanction an increase in the pay-beds, and the Commissioners referred the matter to the Court.

Counsel for the hospital said that either there must be more paying patients or else some of the wards must be closed; to close 74 beds would save £2071 in expenditure, but this would not solve their problem; the only solution, in the view of the board of management, was to establish more pay-beds. Counsel sought to support the change under what lawyers call the *cy-près* rule. This is a doctrine whereby the property of a charity is to be applied as nearly as possible to the donor's intentions; where the scope of the charitable purpose has ceased to exist—for instance, where charities exist for the release of captives imprisoned by the Barbary pirates—the doctrine enables the application of the charity to be varied. On behalf of the Attorney-General, who appears in these cases in order to represent the public interest, it was argued that the *cy-près* doctrine could be applied only if the proposed scheme was the sole possible method of obtaining financial relief. The Attorney-General was stated to be sympathetic to the financial difficulty, but unable to agree to a proposal which meant that one-third of the beds would become pay-beds, when under its rules the hospital existed to provide "free medical and surgical relief and assistance for necessitous poor." It was suggested that the hospital might get help in some other way, by applying to the Ministry of Health or to the London County Council under the Local Government Act, 1929. The Court adjourned the application for a fortnight to give an opportunity for the production of further evidence that all possible alternatives have been considered—though this fact would seem to have been already established. The Attorney-General seems to have hinted that he will favour an increase of pay-beds from 15 to 30—at any rate for an experimental period of 12 months—if it is proved, first, that there is no other way of obtaining relief; and, secondly, that without this relief a large part of the hospital must be closed or carried on in a very different way. The applicants had asked for the increase to 50 either during a limited period or otherwise.

Other hospitals, similarly placed, will watch the case with interest. Continuous increase in taxation dries up voluntary subscriptions, and there are disturbing influences at work for the future.

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MEDICAL PATENTS.

THE problems involved in patents of therapeutic substances are of relatively recent origin. It was not until the late war caused a lack of certain drugs, many of which were subject to patent rights in this country, that the question came before the attention of those concerned with patent rights. The result was Section 38A of the Patents and Designs Act, 1919, which enacted that the comptroller might grant a licence for the preparation of a food or medicine, and should settle the terms of the licence and the amount of the royalty with due consideration for making the food or medicine available to the public at the lowest possible cost, while allowing the inventor a proper reward for his research. This measure aroused considerable controversy in certain quarters, and still further publicity was given to the matter by the alleged commercial abuse of certain medical discoveries and the safeguarding by patent rights of insulin and other new preparations. A large section of the medical profession refused to sanction medical patents in any form, and the British chemical manufacturers declared that their work was being handicapped by this attitude, since it was not shared by many foreign workers. The question came before the representative body of the British Medical Association last year.[1] The attitude of the Association's ethical committee was that a registered medical practitioner ought not to derive any financial benefit from any medical invention or discovery, but that, on the other hand, medical practitioners could not desire to hinder industry or commercial research. A motion to affirm the old ethical position was referred back to the council on the ground that under modern conditions patents must be taken out, for the sake of the public as well as of the manufacturers. The council has once more considered the matter and recommends that the representative body shall this year express the opinion that medical men inventing or discovering substances or processes likely to be of therapeutic value may with propriety use the arrangements allowed by the law for protecting them. They may also accept a just reward, subject to the traditional ethical principle that they must not act against the public interests by unduly restricting the use or knowledge of inventions for their own gain.[2] How this suggestion will appeal to the representative body remains to be seen.

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[1] THE LANCET, 1930, ii., 256.

Meanwhile the Board of Trade has published a report[3] on the subject. The departmental committee heard evidence from—among many others—a joint chemical committee representing several institutions and from the British Medical Association and the Medical Research Council. The joint chemical committee suggested a scheme by means of which dedication would be compulsory for all patents taken out for inventions subserving medical purposes. It was argued that this would assist publication, preserve the British worker from exploitation and prevent any uncontrolled monopoly. The proposal was supported by the representatives of the British Medical Association and the Medical Research Council, but was opposed by a number of other witnesses, chiefly on the ground that any further restrictions on medical patents would discourage research or encourage secrecy. The committee, after very careful consideration, came to the conclusion that dedicated patents would discriminate unfairly against research workers and the fine-chemicals industry in this country and that a sufficient case had not been made out for their adoption. The committee do, however, recommend an alteration in the section where it says: "In the case of inventions relating to substances prepared or produced by chemical processes or intended for food or medicine, the specification shall not include claims for the substance itself, except when prepared or produced by the special methods or processes of manufacture described and claimed or by their obvious chemical equivalents." A decision of the law officer on the word "special" in this section had led in some cases to the refusal of patents for inventions produced by processes which could not be said to contain features of substantial novelty. The word "special" has enabled the Patent Office to refuse applications for mere prescriptions but, as a result of their attempt to hold the balance between avoiding the encouragement of futile claims and not unduly hampering invention, the committee have decided to recommend the substitution of the word "particular" for the word "special," together with the addition of a proviso stating that a mere admixture resulting in an aggregation of the known properties of the respective ingredients shall not be deemed to be a particular process of manufacture.

MOTTLED TEETH.

THE enamel of the teeth, until destroyed by disease or old age, remains as an outward and visible sign of metabolic disturbances occurring in the first three or four years of life. While this statement can hardly be challenged, it does not mean that enamel, once formed, remains unaltered by nutritional changes, for the work of J. H. MUMMERY, E. SPRAWSON, E. W. FISH, and others has shown that enamel is a vital tissue capable of reacting to metabolic changes. But these changes affect the intimate structure of the enamel without changing its outward appearance, so that defects present when the teeth erupt are still apparent in adult life. This defective structure, conveniently termed hypoplasia, may be produced in various ways. A severe honeycombing of the enamel may be associated with rickets. A narrow zone of defective enamel forming a ridge or series of pits running transversely across the crown of an incisor may be caused by childish diseases such as measles or diphtheria. In animals, as MRS. MELLANBY has shown, an absence of vitamin D in the diet may bring about defective enamel formation, with the inference that a similar food deficiency may be responsible for dental hypoplasia in man. It is often possible by examining the teeth to state with fair accuracy the time and duration of some disturbance of metabolism which occurred many years previously. An interesting form of hypoplasia is one described by G. V. BLACK and F. S. MCKAY as mottled teeth. In this condition, while the teeth are of normal form, the cementing substance uniting the rods which form the bulk of the enamel is stained brown or yellow, less commonly opaque white. According to MCKAY, the staining does not occur until after eruption, but it is always preceded by the characteristic mottling. On chemical analysis the stain has been found to contain manganese.

The first account of mottled enamel was given by J. M. EAGER, of the United States Public Health Service, who noticed its frequency among Italian emigrants from Pozzuoli, near Naples. BLACK and MCKAY have since described its occurrence in Colorado, Texas, Virginia, Arizona, and other parts of America; it has been found to exist in regions as far removed from each other as the Bahama Islands, China, Holland, and South Africa. Wherever it occurs the appearance of the enamel is the same. BLACK and MCKAY came to the conclusion that the defect is due to some abnormal constituent of the water supply; but so far the exact nature of the causal agent and the way it acts remain unknown. The latest contribution[1] relates the occurrence of mottled enamel in Bauxite, Arkansas, a community established in 1901 to provide homes for a mining company. The original water supply was from shallow wells and a few springs, but as the population increased three deep wells were dug and the water piped into the homes; the shallow wells were filled in and the sole supply was from the deep wells, the water of which had a disagreeable alkaline taste. A careful examination of the school-children was carried out, and the results correlated with the known dates when the water supply was changed; it was found that no cases of mottled enamel antedated the introduction of deep well-water. The oldest individual with enamel defect was born about the time the deep wells were used. All those who had used the deep well-water during the period of tooth formation had mottled enamel; no child in the town who had lived elsewhere while the teeth were being calcified had this defect. Certain individuals resident in the town and attending school there, but living beyond the area of the distribution of deep well-water, had normal enamel. The strict dependence of the defect on some factor affecting the whole community is shown by the results of the examination of 14 people from 15 to 24 years who had lived in Bauxite two years or more during the period while the wisdom teeth were being formed. The teeth showed clearly that the incidence of mottled enamel depended on the periods when they had lived at Bauxite. In one person who came to the town at four years the incisors had escaped, for they began to calcify previously, but the remaining teeth, including the wisdom teeth, were affected. Another was born at Bauxite and lived there all his life; all the teeth were affected. Eight individuals came to Bauxite between 8 and 12 years, and only the wisdom teeth showed the enamel defect. To serve as a control the children of a neighbouring town were examined. None of them showed mottled enamel, except a certain number who had lived at Bauxite for varying periods during enamel formation.

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[2] Brit. Med. Jour., Supplement, April 25th, 1931, p. 139.

[3] Report of the Departmental Committee on the Patents and Designs Acts and Practice of the Patent Office, 1931. H.M. Stationery Office. Pp. 104. 1s. 6d.

[1] G. A. Kempf and F. S. McKay. U.S. Public Health Reports. Nov. 28th, 1930.

The data gathered in this survey clearly indicate that there is a specific agent or condition in the environment of the town of Bauxite which affects the formation of the enamel of the permanent teeth. This agent is limited to the town, for children living outside escaped. It did not seem probable that food could be the factor, for the mode of life and the diet was the same in the town as in surrounding communities, and the population was attacked irrespective of social status. But while the evidence pointed strongly to the water supply as the incriminating agent, analyses of the water threw no light on the nature of the causative factor. An interesting sequel to this investigation was that steps were at once taken to abandon the deep well supply, and to substitute for it water brought from an adjacent town in which mottled enamel did not occur. This involved piping the water for four miles and passing it through a filtration plant. Bauxite is, we believe, the second community in the world to abandon an apparently satisfactory water supply solely because the evidence suggested that its use was responsible for defective structure of the teeth. A further survey of the community is promised at a later date to ascertain whether the change will bring about the disappearance of mottled teeth. But for this survey we must wait six or seven years.

ANNOTATIONS

IRRIGATION NEW AND OLD.

In a country like Bengal a right policy for irrigation implies not only cheap food and other necessaries but healthy surroundings for the agricultural millions. Sir William Willcocks in a series of lectures now reprinted[1] considers that a wrong policy has been adopted for the last 70 years, with results in certain areas which appalled the delegates of the League of Nations when they made a malaria tour of India some time ago. The history of irrigation systems is full of interest. Six thousand years ago the Egyptians introduced basin irrigation in the Nile valley, digging canals which remain in use to-day. At about the same period the Babylonian kings started perennial irrigation in the joint delta of the Euphrates and Tigris. Three thousand years later, in the light of the ancient knowledge, the Chola kings of Bengal evolved a system of overflow irrigation which led to an era of health and wealth such as central and eastern Bengal have never equalled since it was abandoned. If the views put forward in these lectures are justified—and there is evidently an increasing volume of informed opinion in their favour—the record of irrigation under British auspices in Bengal is deplorable.

Conditions in the Ganges delta are of course widely different from those in Egypt, which is practically rainless, and Babylonia, where there is little rain. A great part of Bengal enjoys an annual rainfall of 50-60 inches. This comes just when all the rivers are in flood, and it was to make full use of the rich waters of the Ganges and Damodar floods, in conjunction with the abundant but poor water of the monsoon rainfall, that the system of overflow irrigation was instituted. Unfortunately the canals were neglected and fell into disuse in the disturbed period which followed the Mahratha-Afghan wars of the eighteenth century. According to Willcocks these works were carried out on the soundest principles. The Damodar was closed and diverted, recalling similar feats performed by the ancient Egyptians when they diverted the Nile to protect the temples of Memphis, and by the Babylonians who turned the Tigris out of its course. In the Ganges and Damodar areas some seven to ten million acres of land were eventually irrigated. The canals still remain as "dead rivers," which have wandered somewhat from their original straight course, owing to the uncontrolled action of the waters, but would still serve their purpose. All they require is re-excavating. In the nineteenth century however the government adopted an irrigation policy which Willcocks holds to have been mistaken. Overflow irrigation on the ancient lines is, he thinks, the only method suitable in Bengal. The Irrigation Department has tried every other kind of project, and all have failed.

When Bernier visited Bengal about the year 1660 he considered it "richer than Egypt." There were immense herds of pigs and goats, and flocks of sheep; fish of every kind abounded; rice, sugar and butter, cotton and silks, were exported in large quantities. A magnificent system of canals served for both navigation and irrigation. Great tracts of country present a very different aspect to-day. The canals are silted up. Railway embankments and roads have obstructed the natural drainage, with the result that large areas have become waterlogged, or gone out of cultivation, and malaria, which was apparently not excessively prevalent in the ancient times, has become a national plague. The fish supply—formerly a very important factor in the diet of the people—has diminished, owing to the absence of the ova which used to be distributed broadcast by the muddy inundations, which also fertilised the soil. The fry which hatched out from these ova played an important part in keeping down mosquitoes, and there is good medical authority for the statement that the increase in malaria has been partly due to the elimination of this factor. Prof. C. A. Bentley is strongly of this opinion in his book "Malaria and Agriculture," while Dr. Bruce Mayne, in a malaria survey of Tanjore where the overflow system prevails, has come to the conclusion that irrigation of this kind stamps out malaria. The disease was only prevalent in the dry parts, in marked contrast to ordinary clear water irrigation where malaria follows the canals.

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[1] Four Lectures on the Ancient System of Irrigation in Bengal and its Application to Modern Problems. By Sir William Willcocks. Calcutta: University Press. 1930. Pp. 128.

Sir William Willcocks's historic work in Egypt and Mesopotamia gives him a peculiar claim to speak on irrigation, and when he urges that the modern policy in Bengal needs reconsideration his views should command attention.

OCCUPATIONAL NYSTAGMUS.

It is often taken for granted that occupational nystagmus is confined to miners, but in the *Journal* of the American Medical Association for April 4th Dr. Carey P. McCord describes its extensive occurrence in train dispatchers, whose work involves following the continual motion of a large paper train sheet, whilst making rapid decisions upon which may depend life and death for passengers or crew. Among 121 subjects 67 per cent. showed nystagmus, 65 per cent. showed deviations from the normal mental state, of which anxiety neurosis was the most common, and 82 per cent. showed cardiovascular disorders. The combination of these signs and symptoms in individual cases was not recorded, but they have apparently the same erratic association as that found in workers in safety-lamp mines. Dr. McCord seems to have been influenced by English writings on miners' nystagmus, and three ætiological views can be extracted from his account: (*a*) the nystagmus may fit into a general fatigue syndrome characterised by nystagmus, intention tremors, tremors of other portions of the body, such as the eyelids, tachycardia or brachycardia, anxiety neurosis, and vasomotor disturbances; (*b*) anxiety neuroses are a natural product of the usual stress and strain incident to the responsibilities of train dispatching in safely moving trains; and (*c*) the high frequency of the use of eyes in connexion with train sheet work leads to overworking of the ocular mechanism, resulting in a nervous syndrome characterised by nystagmus, blepharospasm, some visual impairment, and ocular discomfort. Another association of nystagmus with neurosis, this time in workers on maritime cranes in the port of Genoa, was described by Tedeschi in 1908 in *Ramazzini* (an Italian public health journal now defunct). He emphasised the dangers and discomforts of the work and the need for constant watching of the hook on the end of the chain by which goods were hoisted, and described a resulting disorder that he called "fear neurosis." Some of the subjects of this disorder (29 per cent.) showed nystagmus, but Tedeschi regarded the neurosis as the important and primary condition. It is noteworthy that in each of these examples, as in miners, there is a curious association, not always in the same subjects, of the typical nervous results of danger and stress with oscillation of the eyeballs. In miners there is the additional fact that the majority of men who show oscillation suffer from no symptoms whatever. The orthodox belief that oscillation of the eyeballs causes the nervous symptoms in miners' nystagmus is challenged by psychopathologists, and these examples from America and Italy suggest that the application of statistical methods may support the view that psychoneurotic syndromes in miners do not possess a unique pathology but fall into line with what is known about the general ætiology of anxiety states. Whether the oscillation is a harmless manifestation whose association with the psychoneurosis is haphazard, or whether it is itself merely an accidental part of the psychoneurotic syndrome called forth by special circumstances of ocular stress, will remain an interesting if unimportant problem.

HÆMOSIDERINURIA.

A CASE of hæmosiderinuria has recently been described at length by Prof. Ettore Marchiafava, of Rome.[1] Hæmolytic anæmia with presistent hæmosiderinuria is a form of anæmia not yet classified, and consists in a chronic progressive fatal anæmia, without splenomegaly, and with intense hæmosiderosis of the kidneys alone.

The patient, an airman, was 32 years of age, and began to suffer in 1923 from anæmia with a red-cell count of 2,900,000 and white 7000. In 1927 his condition was thoroughly investigated; the red cells were then 3,078,000, the white cells 4000, and the hæmoglobin content 63. There was notable anisocytosis with microcytes and macrocytes; there was also some anisochromia but poikilocytosis was scanty. Spectroscopic examination of the blood-serum did not reveal the presence of hæmoglobin; van den Bergh's reaction was positive indirect, negative direct. The urine was, as a rule, clear, with short periods when it was wine red and turbid. Microscopic examination of the sediment of the clear urine showed renal cells containing granular matter and casts with infiltration of the same kind. This infiltration gave a blue colour with ferrocyanide of potassium, showing the presence of iron. There were no red cells in this sediment. At the periods in which the urine became coffee-coloured the sediment had the same characteristics as those of hæmoglobinuria with hæmoglobin casts, which, however, did not give the iron reaction. The condition of the patient continued to deteriorate, and in July, 1928, the red cells numbered 1,968,000, the white cells 3000, and there was marked anisocytosis, polynuclear leucopenia, and lymphocytosis. The number of red cells having fallen further to 1,600,000, splenectomy was performed. After two infusions the condition improved but the hæmosiderinuria persisted, and after a three months' interval febrile symptoms set in and ended in the patient's death. At the autopsy there was no trace of siderosis in the liver; the kidneys were large, and showed the presence of iron only in the convoluted tubes; the other organs were free from it, including the spleen.

The ætiology of the disease remains obscure. Of its hæmolytic nature, on the other hand, there is no doubt, as is shown by the continuous elimination through the kidneys of the colouring matter of the blood transformed into hæmosiderin, and by the recurrent hæmoglobinuria. This transformation into one of the hæmosiderinic group, giving an iron reaction, occurs through the operation of living cellular organisms—i.e., the epithelium of the secreting portions of the kidneys. That the spleen could have in this case an abormal destructive function, either within its own parenchyma, or in the circulating blood, as happens invariably in other forms of hæmolytic anæmia, is excluded not so much by the absence of any trace of hæmosiderosis in it as by the failure of any beneficial effect from its ablation. As to the seat of the hæmolysis, it is not the spleen—for the foregoing reasons—nor the liver, nor the bone-marrow, nor the lymphatic glands, since it is impossible to imagine that globular destruction could take place in these organs without leaving the necessary residual changes. Hæmolysis in the circulating blood is not reconcilable with the absence of splenic enlargement, of siderosis in the liver, or of copious urobilinuria, and with the fact observed by Micheli that the amount of iron, which is increased in the urine, remains normal in the fæces. The red cell destruction must therefore take place in the vascular system of the kidneys, and occurs in two ways, one persistent and slow by the transformation of the hæmoglobin into hæmosiderin in the protoplasm of the renal epithelium, the other rapid and violent, whence the recurrent hæmoglobinuric crises. The disease, of which the case described is an example, is a form of anæmia of a special type which is easily distinguishable from all other forms—i.e., hæmolytic splenomegaly, pernicious anæmia, and the various forms of hæmoglobinuria. Micheli proposes to give to this disease the name of "hæmolytic anæmia with hæmoglobinuria and hæmosidinuria." But considering that the hæmoglobinuria shows itself only by crises at variable intervals and sometimes as in the first case described by Nazari once only in the long course of the disease, and considering that on the contrary the hæmosiderinuria is constant and persistent up to the day of death, it appears that the greater importance is attached to this, and that the proper appellation should be hæmolytic anæmia with persistent hæmosiderinuria.

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[1] Policlinico, Medical Section, xxxviii., March 1st, p. 105.

FACTORS IN SEXUAL IMPOTENCE.

THE sexual neurotic is unhappy not only because of his disability but because he is generally in despair of finding anyone who is prepared or able to help him. As Mr. Townley Clarkson pointed out last Friday at a meeting of the Society for the Study of Venereal Disease, impotence lies in the no-man's land of ailments between the neighbouring claims of the genito-urinary surgeon and the neurologist. The surgeon, as a rule, has little time for what he too frequently regards as a minor ailment, whilst the neurologist, skilled though he be in the treatment of functional disorders, has little expert knowledge of the organic lesions that may attack the organs of sex. Mr. Kenneth Walker, in his opening paper at the same meeting, laid stress on the psychological factors in the causation of impotence. Even when an organic lesion is found it is more likely than not that this has served only as a nucleus around which a functional trouble has formed. This indeed is the manner in which many other functional disorders arise, and although the elimination of the original lesion may be part of the treatment, a cure will not be effected unless the psychological difficulties to which the lesion has given rise are got rid of. It was, he pointed out, a matter of considerable difficulty to interpret the exact significance of the changes which were found in the genital tract of sufferers from primary impotence. These changes were well recognised by genito-urinary surgeons, and consisted of a swelling and tenderness of the prostate, and particularly of that portion of it known to anatomists as the verumontanum. Sometimes, when the trouble had been preceded by a prostatitis, these changes were definitely the cause of the impotence, but more often than not no history of infection could be obtained, and the changes in his opinion must be considered secondary rather than primary. Functional disorders were often associated with an upset in vaso-motor control, and the swollen and hyperæsthetic verumontanum of impotence was a phenomenon similar in nature to the *tache cérébrale* of hysteria. But while laying emphasis on the psychological factors in the causation of primary impotence, the physical investigation of the genitalia was, in Mr. Walker's opinion, of the very greatest importance, not only because of the necessity of discovering any organic lesion that might be present, but because it was only by being thorough that the patient's confidence could be gained.

THE NEGATIVE PHASE IN ANTIDIPHTHERIAL IMMUNISATION.

Dr. Richard Prigge[1] has been carrying out investigations in the State Institute for Experimental Therapeutics at Frankfurt a.M. to determine whether active immunisation of guinea-pigs against diphtheria produces a so-called "negative phase" or increased susceptibility to the disease. He found that guinea-pigs which had been immunised against diphtheria toxin or living diphtheria bacilli did not show any increased susceptibility to diphtheria toxin before immunity was obtained, nor any increased susceptibility to infection by diphtheria bacilli provided that the doses of the vaccine were not too high. Increased susceptibility was only produced when a large overdose of the vaccine had been used. He was unable to decide whether a negative phase in the ordinary sense of the term had taken place in this experimental intentional overdosage which is not likely to occur in the human subject, or whether the symptoms were merely the result of an excessively large dose of vaccine. In human inoculation of diphtheria toxin the dose employed is 1 to 200 times smaller than that used in experiments on animals without causing an increase in susceptibility. The experiments strongly suggest that the development of increased susceptibility, or of the so-called negative phase, can be excluded in human inoculation against diphtheria.

TESTICULAR GRAFTS ON RAMS.

THE somewhat extravagant claims made by grafting enthusiasts have induced two Australian veterinary surgeons, Mr. R. M. C. Gunn and Mr. H. R. Seddon, to repeat the experiments carried out by Voronoff and record their results.[2] The rams used were divided into three groups. In the first group the object was to determine the fact of testicular tissue being viable after being grafted for varying periods into the scrotum of young male rams. The second group was employed to determine whether increased production and hastened maturity could be obtained by means of the testicular grafts, and the third to determine whether old senile sterile rams could be reinvigorated and rejuvenated. The operative technique employed was that which Voronoff has made familiar. The conclusions arrived at were as follows: (1) Normal living, but not growing, testicular and epididymal tissue can be recovered as long as 24 days after grafting merino rams. (2) Absorption of testicular tissue grafted on the parietal tunica vaginalis of the scrotum appears to be rapid, usually occurring in young rams within one year. (3) There is no good evidence of any beneficial influence on body-weight or wool-production as a result of testicular grafting or of injections of pulped testis or saline extract of testis. The operations were done with a proper use of control animals and in a critical attitude of mind. Whilst the results seem to establish Voronoff's contention that grafts implanted by the method he recommends are viable, they clearly indicate that they do not live so long as he supposed. Gunn and Seddon point out that any beneficial effect produced by the absorption of grafts can be of very little importance since the storage capacity of testicular tissue is infinitesimal. Apparently, therefore, testicular grafting is not likely to be of much use either in human or in veterinary practice. In any case its high cost would limit its utility in the stock-breeding yard.

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[1] Med. Klinik, March 20th, p. 419.

[2] Austral. Vet. Jour., Sept. and Dec., 1930.

TRACHOMA IN POLAND

AMONG the general population of Poland the incidence of trachoma is estimated at about 1 to 1·5 per cent. It had a great stimulus after the war when about 3,000,000 refugees were repatriated from Russia. In 1919 compulsory notification was enacted and the numbers notified rose continuously between 1920 and 1929. The measures taken to combat the scourge are told by Dr. M. Zachert, chief of the anti-trachoma service.[1] Special dispensaries, hospitals, and mobile units have been founded and the number of cases treated in 1929 at these institutions was over 35,000. Periodical examinations are made in the schools and among recruits, children's refuges, and orphanages. Thirteen special hospitals for trachomatous children have been founded, each hospital having a school so that the children's education can be carried on uninterruptedly just as it is at Swanley. The results obtained in these hospitals have been distinctly good. Out of 6640 children admitted in ten years 5157 have been cured. Whereas in 1924 the percentage of trachomatous children in the orphanages was 13 per cent., in 1929 it was reduced to 5 per cent. We are not told in what the routine treatment producing this result consisted. Besides the hospitals for children there were in 1929 260 dispensaries treating over 31,000 trachomatous patients and two mobile hospitals in which operations were performed. An important part of the campaign is the holding of special trachoma classes for doctors at the State School of Hygiene, the number of doctors having attended these courses being 220. The whole campaign is financed by the State, the amount allocated to it in the budget of 1929 being a million and a half French francs.

PLANKTON AND BACTERIA IN SEWAGE.

THE rôle of bacteria in the purification of sewage has been recognised for the last 40 years, and it is well known that the bacterial flora of an effluent is, under *suitable conditions, an efficient oxidising agent.* The less numerous but nevertheless large population of infusoria or protozoa always found in sewage and polluted waters has been less carefully studied, although the presence of such organisms has been recognised as collateral evidence of pollution. In the sea the drift of this vast population of feebly motile organisms, conveniently known as plankton, determines the movements of the fish which feed on it, for the plankton is to the sea what the grass is to the land. The United States Public Health Service has been conducting researches on the more intimate mechanism of sewage pollution, and in a recent report[1] C. T. Butterfield, W. C. Purdy, and E. J. Theriault have described the influence of typical plankton on the biochemical oxidation of organic matter. Having prepared dilute dextrose-peptone solutions which could be readily and accurately reproduced, and which could be kept, when sterile, for long periods without absorbing the oxygen of the air dissolved in them, they studied the effect of inoculation with various bacteria. These in all cases multiplied rapidly and absorbed oxygen until in about two days a limit of both bacterial population and oxygen absorption was reached, this state being sooner and more definite with pure culture than with mixed organisms. A technique having been devised whereby colpidium, a small paramecium-like organism, could be washed and kept free from bacteria, cultures of this were introduced into the dilute (5 mg. per litre) and sterile dextrose-peptone medium in which they did not multiply, although they throve fairly well in a *medium a hundred times the strength,* showing that a certain concentration of food was necessary if they were to be kept alive on a slop diet. When introduced into solutions seeded with bacteria the result was very different. The bacteria increased as before, but as the protozoa also increased their numbers fell off to a fairly steady figure and both kinds of organisms lived together, oxygen absorption going on steadily as it does in naturally polluted water. It seems therefore that in this, as in similar cases among the higher animals, a balance of vegetable and animal life, of food collectors and food consumers, is reached. The only stable communities are complex ones, the predatory members of which, by taking their toll of the others, enable them in the mass to live successfully and to fulfil their natural functions, which in this case, from an economic standpoint, is the collection of putrescent colloid and other matter for oxidation. Protozoa, it would therefore seem, are useful members of biological filters, and their presence is vitally necessary in activated sludge.

THE GROWTH OF VISUAL PERCEPTION IN CHILDREN.

IT has been frequently suggested both by physiologists and psychologists that perception is subject to laws of its own; that, in fact, these are very elementary compared with the appreciations of the external world in which fully fledged intelligence is in operation. The work of the Spearman school, which has given *an impulse and new direction* to the mathematical assessment of general intelligence (or rather the function "g"), has led to the exploration of the whole process of cognition by means of graduated test material. With this guiding principle of method in the forefront of the investigator's mind, the special abilities in man were investigated separately and correlated with such particular functions as imagination, and with the processes involved in practice, fatigue, and perseveration. It is inherent in the Spearman theory that perceptual experience which falls within the laws of cognition should also be obedient to the same laws of the mind, as the higher processes of cognition—that is, the eduction of relations and the eduction of correlates.

Prof. W. Line,[2] working in the school of Spearman, has come to the conclusion, from carefully calibrated tests, that it is futile to use separate tests for perceptual experience and that dichotomy of thought and perception is not acute, but one of degree only, and that quantitatively and qualitatively the same laws of cognition are in operation. It is necessary, in the interest of clarity, to pause and consider what this discovery means, for it brings into the discussion the much debated theory of perception for which we are indebted to Kohler, Koffka, and Wertheimer, the so-called Gestalt or configuration theory of perception, and its relation to the apparently divergent theory of relational perception which is the outcome of the Spearman school to which Line enthusiastically belongs. In fact, Line has, from his carefully planned research, shown what he believes to be the truth of Spearman's laws of cognition as applied to visual perception. He stresses the distinction, however, between primary and secondary perception. The first includes the bare apprehension of a percept and the eduction of relations, while the second embraces supplementation due to past experience, together with supplementation which is due to the eduction of correlates. In his researches he discovers that "the growth in the capacity to perceive similarities of 'form' appears to take place in a manner directly parallel to the development of 'g,' at least, the two powers are highly correlated." His results point to what he calls a multistratal growth—an increase in the capacity to perceive relations in all levels simultaneously. In arranging his investigation he chose for his test material spacial diagrams, with and without meaning, pictures with meaning, three-dimensional models, and cinematographic representations. He draws the conclusion that in the appeciation of relations we have "the very woof and warp of shapes or whole qualities. The elementary relations of the lowest levels in themselves form fundaments for relations of the highest order."

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[1] Bull. Off. Int. d'Hyg. Publ., March, 1931.

[1] U.S. Treasury Dept. Public Health Reports, 1931, xlvi., 393–426.

[2] Monograph Supplement XV., Brit. Jour. of Psychol., 1931, 12*s*. 6*d*.

Prof. Spearman believes that Prof. Line has given a new orientation to the subject of mental testing, and believes that the light that this investigation throws upon perceptual growth must lead to the discarding of many established tests. The fact remains, however, that the fundamental concept of relations belongs to epistimological studies rather than to the domain of experimental psychology—that is, do relations as such exist in the mind independent of the terms which they bind together? The speculation, however, does nothing to detract from Prof. Line's thorough and stimulating inquiry.

THE PATHOGENESIS OF PINK DISEASE.

In spite of the interest which pink disease has attracted since the publication of Swift in 1914, and of Feer in the early post-war years, the real nature of this disorder remains undecided. Though much work has been done on the morbid anatomy, the findings of different observers have varied so much that no single lesion has been established as essential. The morbid changes in peripheral nerves and anterior horn cells found in some cases have been absent in others, and their underlying cause is still obscure. Hypotheses to account for the condition have been based on clinical analogies rather than positive evidence. Of these hypotheses, one which was in some favour a few years ago, especially in America, arose from the resemblance borne by pink disease to pellagra, from which it was inferred that it was a manifestation of avitaminosis. Latterly this view has somewhat lost ground, because of the number of cases reported in which vitamin deficiency could be excluded. There remain as alternatives those old favourites, the alimentary toxæmia, absorption from septic foci, and systemic infection, and for none of these has the case yet been proved.

The view that pink disease is infective is strongly supported by M. Péhu and A. Mestrallet.[1] They have previously sought to establish its nosological identity with the epidemic "acrodynia" of 1828 and they now bring forward further arguments in favour of its being a specific infection of the nervous system closely analogous to encephalitis. The cases, they say, show signs of grouping into certain localities, and some of the psychic disturbances, notably the intractable insomnia, bear out the analogy. From the standpoint of morbid histology further arguments are adduced. They give a full summary of two published necropsies (Francioni and Vigi, Kernohan and Kennedy) and compare them with the findings of Paterson and Greenfield, Byfield, and others. In the first case the most significant observations were degenerative changes in the cells of certain mesencephalic ganglia; Francioni and Vigi also found cellular infiltration in the region of the cervical sympathetic ganglia, of the nature of perivascular cuffing. The changes found by Kernohan and Kennedy were more diffuse; there were signs of degeneration and demyelination (but not inflammation) in some peripheral nerves, especially the sciatic, and some chromatolysis in the posterior root ganglia; chromatolysis was seen to the greatest extent in the cells of the mesencephalic ganglia. A point on which all the observers quoted are in agreement is that the cells of the hemispheres and cerebellum are unaffected, though Warthin found a condition of meningeal œdema.

Péhu and Mestrallet think the evidence they have collected justifies the classification of acrodynia as an infective disease closely allied to encephalitis, probably caused by a neurotropic virus which produces diffuse lesions but shows a predilection for the mesencephalic centres of the autonomic system.

STREPTOCOCCAL VARIATION.

It was Prof. H. Schottmüller, of Hamburg, who first classified the streptococci according to their action on red blood corpuscles incorporated in the culture media on which they are grown. As is well known some of the streptococcal colonies show after incubation a clear area around them in which the red cells are completely hæmolysed, others show a green appearance due to partial hæmolysis, and yet a third group appears to have no action on the red corpuscles in the culture material—the groups being named respectively as hæmolytic, green (*viridans*), and non-hæmolytic. How closely this grouping bears on the ability of the organism to produce disease in man is apparent from much recent work—witness the Guy's Hospital study on which we commented three weeks ago.[2] Schottmüller and his pupils have, however, now brought forward evidence[3] to show that while truly hæmolytic and green streptococci keep their characteristic appearances on subculture, a degradation of the hæmolytic streptococci into the appearance of *S. viridans* may under certain conditions occur. Their results appeared in the course of experiments on the relation of the infecting hæmolytic streptococci to puerperal fever. Normally the uninjured female vagina does not contain hæmolytic streptococci; these are introduced from without, as Semmelweis rightly surmised, and with the subsidence of the infection they disappear. Schottmüller and his fellow-workers have followed up this disappearance. They introduced hæmolytic streptococci, which had been incorporated in silk threads by placing the threads in virulent broth cultures and then drying them, into the vagina of healthy non-pregnant women and found that, on withdrawal after a few days and subculture, relatively few hæmolytic colonies were recovered but a correspondingly large number of green streptococci. Further a degradation of the hæmolytic streptococci occurred when the silk threads after drying between blotting-paper were left in sterile flasks; cultures made at varying times later showed that a dying-out of streptococci was accompanied by a diminution of the hæmolytic power of the remainder, and indeed by a loss of virulence to mice. The hæmolytic power and virulence could be rehabilitated when the streptococci were subcultured in fresh blood media or by passage through the bodies of laboratory animals such as mice. These results explain certain anomalies in the subculture of the hæmolytic group which have troubled bacteriologists. But there is no evidence that the true *S. viridans* can be made to take on hæmolytic powers. Its characters and pathogenicity bring it into a class by itself.

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[1] *Rev. de Méd.*, Jan., 1931, p. 1.
[2] THE LANCET, April 11th, p. 819.
[3] Klin. Woch., Jan. 17th, p. 107.

RADIOGRAPHY OF ABDOMINAL ARTERIES.

The use of arteriography in cerebral conditions was briefly reviewed in our issue of Jan. 31st. (p. 249). A similar method of examining the abdominal aorta and its branches is now described and illustrated by Portuguese workers [1] and has been applied, it is stated, in more than 100 cases. The aorta is punctured posteriorly, an opaque fluid is rapidly introduced through the needle, and a radiogram is taken during the injection. To limit and concentrate the circulation of the fluid in the branches of the aorta, tourniquets are applied to the upper thighs. The solution originally used was one of sodium iodide in high concentration, but this caused somewhat severe pain when it reached the smaller arteries and arterioles. The substance called abrodil, which is now employed instead, is an organic compound of iodine which is commonly used in urography. Twenty grammes are injected and it is said to prove relatively non-toxic, giving a good opaque shadow, and causing less pain than sodium iodide. It would be interesting to know whether the new Japanese substance named l'ombre would be even more satisfactory. As a preliminary the splanchnic nerves are anæsthetised by injection of novocain around the area in front of the twelfth dorsal and first lumbar vertebræ. The needle is inserted to a depth of 10 to 11 cm. from a point four fingers-breadth to the left of the mid-line posteriorly under the twelfth rib towards the vertebral bodies. After a short pause it is pushed in a further 1–2 cm. and pierces the abdominal aorta. The abrodil solution is then quickly injected by a special apparatus under a standard pressure and the films are taken at this moment. Stereoscopic photographs can be made and in this way the interpretation is made easier. In this technique the authors claim to have evolved a simple, certain, and harmless method of great value in diagnosis, because it shows the blood-vessels of the abdominal viscera. Since the abrodil is excreted by the kidneys it is, moreover, possible to secure radiograms of the urinary tract during the 10 or 20 minutes following the injection. The photographs reproduced certainly give a clear picture of the abdominal blood-vessels, and the method is likely to give important information about the anatomy and perhaps the physiology of the abdomen. Its value in the diagnosis of disease also seems to be considerable, though at present the technique is hardly perfect enough to warrant its general use. Its originators are to be congratulated, however, on their ingenuity and achievement.

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[1] Santos, R. dos, Lamas, C., and Caldas, P.: Presse Méd., April 18th, p. 574.

We regret to announce the death on April 27th of Sir Byrom Bramwell, consulting physician to Edinburgh Royal Infirmary and sometime President of the Royal College of Physicians of Edinburgh. He was in his eighty-fourth year.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

The following appts. are made:—Surg. Comr. F. G. Hitch to *Victory*, for Haslar Hospital; Surg. Lt.-Comr. E. J. K. Weeks to *President*, for post-graduate course, and to *Tamar*.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. M. B. H. Ritchie retires on retd. pay.

Maj. (temp. Lt.-Col.) D. F. Mackenzie to be Lt.-Col., vice Lt.-Col. M. B. H. Ritchie.

Maj. and Bt. Lt.-Col. T. H. Scott to be temp. Lt.-Col.

Lt. W. F. Lane to be Capt.

ARMY DENTAL CORPS.

C. A. Pank to be Lt. (on prob.).

ARMY RESERVE OF OFFICERS.

Maj. J. E. H. Gatt having attained the age limit of liability to recall ceases to belong to the Res. of Offrs.

TERRITORIAL ARMY.

Capt. C. S. Atkin resigns his commn. and retains his rank, with permission to wear the prescribed uniform.

Capt. W. S. C. Copeman, from Active List, to be Capt.

J. S. Moore (late Surg. Sub.-Lt. R.N.V.R.) and D. Macleod to be Lts.

G. K. Thornton (late Lt., R.F.A. Spec. Res.) to be Lt.

H. R. Ferguson (late Offr. Cadet, Cambridge Univ. Contgt., Sen. Div., O.T.C.) to be Lt.

Supernumerary for Service with the O.T.C.—Lt. W. A. Mackey to be Capt.

ROYAL AIR FORCE.

Dental Branch.—Flying Officer A. P. Atkins is granted a non-permanent commission as a Flight Lieutenant.

Flight Lt. W. Wormington, Capt. A.D.C., relinquishes his temporary commission on return to Army duty.

Royal Medical Benevolent Fund.—During the first quarter of this year the sum of £3050 has been voted in grants to applicants, as against £2562 during the corresponding period of last year. Subscriptions received during the same period amounted in 1931 to £2499, but in 1930 to £2628. At the April meeting the committee voted £705 to 45 applicants.

One recipient was a widow aged 43 with a daughter aged 9 who called at the office of the Fund. Her husband qualified in 1914, joined the R.A.M.C. and served throughout the war. He was wounded at Ypres in 1915 and was four times mentioned in despatches. The latter part of his service was with the British Military Mission in Siberia. While there he married a Russian lady who was engaged in Red Cross work in Siberian Hospitals. After demobilisation he practised in the Far East from 1919 to 1930. As the result of an accident he died at the age of 42. The practice was sold, and it is expected that the estate will yield an income of £70 a year. The first dividend not being payable till June, the Fund has given a grant of £26 to the widow and arranged with another charity to give a similar sum to tide her over her present difficulty. The Royal Masonic Institution has undertaken the education of the child. Employment is urgently needed for the widow. She speaks English and French fluently as well as Russian.

Subscriptions and donations to the Fund should be addressed to the hon. treasurer at 11, Chandos-street, London, W. 1.

SPECIAL ARTICLES

IMMUNITY IN VIRUS DISEASES.*

By C. H. Andrewes, M.D., M.R.C.P. Lond.,
MEMBER OF THE SCIENTIFIC STAFF, NATIONAL INSTITUTE FOR MEDICAL RESEARCH, HAMPSTEAD.

I.

Two properties of viruses are probably particularly mportant. Firstly, on their small size depend the facts that they will mostly pass through candles or membranes impermeable to the majority of bacteria and that they can be seen or stained not at all or only with great difficulty and by the aid of special methods. Secondly, they are apparently intracellular parasites, and this is probably the reason why so little success has been encountered in attempts to cultivate them on cell-free media; upon this property, too, doubtless depends the existence in many virus diseases of the remarkable intranuclear or cytoplasmic "inclusion bodies" which I shall refer to later. The immunological properties of viruses are probably related to both the above properties—small size and intracellular parasitism.

Duration of the Immunity.

The study of immunity to viruses is rather a hopeful one because in the field of active immunisation against viruses there are some striking successes which greatly encourage workers at the present day. Such successes probably depend largely on the fact that so many virus diseases leave behind them a solid and lasting immunity. If you go through the list of known virus diseases carefully, you cannot, I think, help being struck by the large numbers of virus diseases which *are* followed by solid immunity. A few are invariably fatal and therefore cannot be considered in this connexion. Of the rest you will find four familiar ones—herpes simplex, the common cold, influenza (if you believe that to be a virus disease), and foot-and-mouth disease, in which the mmunity is rather transient. But you will readily find a couple of dozen virus diseases in which the mmunity is fairly durable; these include most of the specific fevers of childhood (see Table I.). Indeed, the specific fevers are classed together partly because they are diseases of childhood which do not tend to recur. Adults infrequently get chicken-pox or poliomyelitis probably because they have had either the disease or a "subclinical infection"; adults in isolated communities such as the Faeroe Islands who have never been exposed to measles prove just as susceptible as children when they do come into contact with the infection.

Table I.—*Virus Diseases followed by—*

LASTING IMMUNITY.		TRANSIENT IMMUNITY.
Small-pox.	Poliomyelitis.	Common cold.
Measles.	Yellow fever.	Herpes simplex.
Mumps.	Cattle plague.	Foot-and-mouth disease.
Chicken-pox.	Swine fever.	Influenza (?)
Herpes zoster.	Dog distemper.	
&c. &c.	&c.	

The bacterial diseases whose symptoms are definitely associated with a toxin—e.g., diphtheria—leave behind a good immunity, but if I were to ask you to name others which do so you would say at once "typhoid fever," and then scratch your head and begin to think.

It is obviously nonsense to say that this question of solid or transient immunity will avail to demarcate virus diseases from bacterial ones; it is equally absurd to deny that viruses (and, we may add, toxins) have a stronger tendency than bacteria towards the production of a lasting immunity. Let us consider to what this lasting immunity can be due; three possible factors must be dealt with.

(1) CONSTANT REINFORCEMENT OF IMMUNITY.

Firstly, it is probable that immunity to any organism will last much longer if the immune person is constantly exposed to the infecting agent, so that the immunity following an attack of the disease is constantly being reinforced by little doses, too small to overwhelm his defences and give him a fresh attack. There is evidence that this is so as regards maintaining immunity to diphtheria and typhoid fever. It is very likely true with virus diseases also. With a virus like that of the common cold which leaves behind only a transient immunity such a mechanism probably plays a part. Witness the colds which immediately affect Arctic explorers as soon as they return to civilisation. But it does not follow that this reinforcement of immunity is essential in virus diseases. People who have had yellow fever in the tropics many years ago and have then gone to live in countries where the disease does not exist may be found, years and years afterwards, to have good neutralising antibodies in their serum.

(2) PERSISTENCE OF VIRUS IN IMMUNE HOST.

Secondly, it has been suggested that immunity to a virus may be associated with persistence of that virus in the immune animal; the same sort of thing is known to occur, of course, in syphilis. If viruses do so, it is presumably in some remote hiding place in the body, for convalescents from specific fevers due to viruses are not commonly a source of infection to others. It is possible, however, for vaccinia to persist in an inoculated rabbit for many weeks in spite of the presence of potent antibodies in the animal's body fluids, and for fowl-pox virus to remain even longer in the tissues of a recovered bird. An instructive example is afforded by the submaxillary virus of guinea-pigs. This virus occurs in the salivary glands of almost all adult guinea-pigs of certain stocks. Such adult guinea-pigs are immune to the effects of this virus introduced elsewhere into their bodies. But very young guinea-pigs, which do not harbour the virus in their salivary glands, will die of acute meningitis if the virus is inoculated into them intracerebrally, or they will develop an acute local lesion if it is injected into them at any other site. How the virus manages to persist at one site—in the salivary glands—of the immune adult guinea-pigs is a mystery.

A still more striking example is afforded by the infectious anæmia of horses. Here the blood of horses which have apparently recovered from the disease is found to be virulent when injected into other horses—for as long sometimes as 14 years afterwards. The horses carrying the virus thus are not, however, really immune as they may have a relapse at any time.

The idea that a virus may be latent in an immune or insusceptible host is a familiar one to workers with viruses infecting plants. Certain races of potato are immune from the attack of a certain kind of potato-mosaic virus, but when grafting experiments are carried out from such an immune race to a susceptible variety of potato, the susceptible race becomes infected and it thus becomes clear that the immune sort is a carrier of the virus, which must live in its tissues without causing any harm. I do not propose to discuss whether or not bacteriophage is a virus, but it certainly behaves like one in many respects; here again it appears that an organism like *B. coli* may permanently "carry" a phage which does not affect it, but can cause lysis of another organism, the dysentery bacillus. I am not suggesting that there is any certainty that this sort of thing is a usual occurrence with animal viruses; but the possibility is very well worth while bearing in mind.

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* Two lectures (abridged), delivered at University College Hospital Medical School on March 17th and 24th, 1931.

(3) NATURE OF THE HUMORAL IMMUNITY.

The third factor which may help to explain the persistent immunity to viruses lies in the nature of the humoral immunity. In suggesting that this is somewhat different from humoral immunity to bacteria, I do not mean to imply that the body's response is necessarily different in the two cases; only that the antibody which develops may be effective in a rather different way. Bacteria sensitised or coated by antibody are not, by that alone, killed or prevented from multiplying; only when phagocytes come to engulf or destroy them or complement to lyse them are they put out of action. But it seems likely that a small body such as a virus when it unites with antibody may have its physical properties so altered that it cannot attack and enter the susceptible cell; the antibody has effectively neutralised it as an antitoxin does a toxin, directly, without the necessity of calling in complement or leucocytes to help it. This mode of neutralisation may well be more effective than the more cumbrous mechanism which has to be used against bacteria. As a rough generalisation it seems true that a purely humoral mechanism is most effective against the smallest noxious agents. It is very effective against toxins and viruses; less so against bacteria; still less so against larger things such as protozoa and worms.

It is possible passively to immunise animals against many virus-diseases with immune sera. These sera may be quite ridiculously effective; apparently one-tenth of 1 c.cm. of immune serum will suffice to confer upon a monkey a passive immunity which will protect it from infection with yellow fever virus. Extremely small quantities of serum will also passively protect against measles and dog distemper.

A number of experiments reveal that the inactivation of a virus by immune serum is not a perfectly simple business. One cannot simply say that the antibody unites with the virus and destroys it. On the contrary, one can inactivate a virus with immune serum and then restore its activity again. One can make a mixture of vaccinia virus with immune serum and have so much immune serum present that the mixture inoculated into a rabbit's skin in a dose of one-tenth of 1 c.cm. produces no lesion; one then dilutes the mixture ten or a hundred times and inoculates one-tenth of 1 c.cm. of that into the rabbit; though the rabbit receives only one-hundredth of the original dose of virus a lesion will commonly result; dilution has reactivated the neutral mixture. This phenomenon can be demonstrated with a number of viruses including fowl-plague, vaccinia, herpes, and poliomyelitis. This experiment along with others at one time led me to doubt whether virus and antibody united at all in the test-tube and to wonder whether the union might perhaps only occur in the body. This suggestion, however, is not a valid one; for if virus and serum are kept in contact for a long time in vitro it will no longer be possible to reactivate the mixture by dilution; a firm irreversible union has apparently occurred. This only takes place after some days in the case of vaccinia; with other viruses the firm union probably occurs after a few hours. This reactivation of a neutral mixture by dilution has a close parallel in experiments with toxins and antitoxins; neutral mixtures of tetanus, diphtheria, and botulinus toxins with their appropriate antisera can be rendered toxic again by dilution; but here again it is only possible when the mixtures have not been left standing for too long beforehand. It is supposed in this instance that the toxin-antitoxin union is at first loose and can be dissociated by dilution, but becomes firm and irreversible later; and it is extremely probable, though not yet proved, that the same is true of a virus-antibody combination. If it turns out that an immediate loose union of virus and antibody occurs, it is important to realise that this loose binding is most often quite effective in stopping the action of the virus; the later irreversible reaction (if you like, the actual killing of the virus) is an added luxury. For experiments which I shall refer to later make it clear that a virus can [illegible] a susceptible cell very rapidly (within a few minutes) and that immune serum can exert its protective action immediately—long before the virus-antibody union could have gone on to the irreversible stage.

Part Played by Complement and Leucocytes.

I stated that the immune sera could apparently neutralise a virus without the help of complement or leucocytes. It is difficult to be absolutely certain of this because one's ordinary test for neutralisation is to inoculate a serum-virus mixture into an animal, and although that mixture may contain no complement or leucocytes, yet these may, of course, be supplied as soon as the mixture gets inside the animal. Nevertheless, a good deal of indirect evidence suggests that they are not necessary. One can study the neutralisation by immune serum in tissue cultures. In vivo the virus of herpes simplex produces in cells of the rabbit's testis, both in cells of the parenchyma and interstitial tissues, oxyphilic intranuclear inclusion bodies. One can cultivate herpes in tissue cultures of rabbit testis in dilute rabbit serum. A very primitive technique will serve—one in which the tissue cells do not multiply, but merely survive for a few days. In such cultures there develop in the nuclei of the cells inclusion bodies exactly like those which the herpes virus forms in the living animal; one can look for these inclusions in stained sections of pieces of tissue from the cultures and thus tell whether or not the virus has grown, without recourse to any further animal experiment. Immune serum will protect the cells in such a culture so that no inclusions will develop and the virus will die out. One can be quite sure that leucocytes play no part in the inactivation of virus in such an experiment; the leucocytes present are scanty and immobile. One can be reasonably sure also that complement plays no part; for one can use washed cells, inactivated serum, and a virus which has been stored for some time.

It is, of course, conceivable that these neutralising antibodies react with some toxin or aggressin secreted by the virus and not with the virus itself. If that were so there would be no real difference between the inactivation of a virus and of a bacterium. But until such toxin or aggressin is demonstrated, economy of hypothesis makes us regard the antibody as reacting with the virus itself.

Serological Reactions other than Neutralisation.

Neutralisation of the virus is not the only property demonstrable in these immune sera. Complement-fixation reactions have been shown to occur by workers with the viruses of vaccinia, herpes, yellow fever, foot-and-mouth disease, dog distemper, and other viruses. Against vaccinia, further, a flocculation reaction has actually been used in the field as a method of diagnosis. Crusts of the lesions from cases of suspected small-pox are put up against a vaccinia-immune serum; a positive flocculation reaction suggests small-pox, a negative one chicken-pox or other disease as the diagnosis. But, just as with the corresponding reactions in bacterial diseases, we do not know what part, if any, those test-tube phenomena actually play in the immunity of the animal; nor whether the antigen concerned in them is the virus itself; nor whether the antibodies are identical with or run parallel with the neutralising antibodies.

It is also clear that, even if immune serum can inactivate a virus without the help of leucocytes, yet leucocytes *do play a part in destruction of virus*. Possibly they clear up and destroy virus which is prevented by its union with the antibody from getting inside susceptible cells. Normal rabbit leucocytes have considerable power to destroy vaccinia virus, and this destruction is helped by a heat-labile constituent of normal serum. But immune serum contains a heat-stable constituent which is still more effective in helping forward this destruction. The analogy with the mechanism of destruction of bacteria by phagocytes is obvious.

Cellular Immunity.

It has been maintained that immunity to viruses is a very special thing depending particularly on the cells and owing very little to antibodies; furthermore, that each tissue of the body—brain, skin, cornea, and so on—can develop its own immunity more or less independently of the rest of the body. These views have not met with much support in this country. It has been argued in their favour that a man vaccinated against small-pox is still immune at a time when antibodies can no longer be demonstrated in his serum; similarly, antibodies cannot be demonstrated by ordinary methods in guinea-pigs which are immune to foot-and-mouth disease as a result of vaccination. Instead of denying the existence of neutralising antibodies under such conditions it would seem more reasonable to suppose that the test for immunity to these viruses is more delicate than the tests available for detecting antibodies. An interesting light is shed by the tissue-culture experiments referred to earlier; in them it was found that herpes virus would grow in normal rabbit testis with normal rabbit serum, but not in immune rabbit testis with immune rabbit serum. On analysing this result by means of further experiment, it was found that immune serum prevented the virus from growing in normal rabbit testis, but that the virus would grow perfectly well in a culture of testis from an immune rabbit in normal serum. The immune serum was the important factor —it did not matter so much whether the cells came from a normal or an immune animal. However, one must not take up too extreme an attitude; cellular immunity doubtless plays some part.

The virus diseases which are not followed by lasting immunity are of particular interest. Herpes simplex, for instance, can recur in one subject again and again. Seventy-five per cent. of normal people appear to have antibodies to herpes virus in their serum, and those who are subject to recurring herpes seem all to have powerful neutralising sera; why, then, does their herpes keep recurring? Rabbits develop as good an immunity to herpes as to vaccinia; why *cannot* man? Possibly man is as solidly immune, on paper, as he is to other viruses, but the herpes virus *is able to circumvent* in some way the humoral or other defence mechanisms which are quite efficient *against other infections*.

Failure of Immune Serum to Affect Intracellular Virus.

It seems probable that an immune serum cannot neutralise a virus which is intracellular. Could it *do so*, it would be hard to explain how viruses could persist at all in animals with antibodies in their sera; and many viruses undoubtedly can do this. Many viruses can attack cells very quickly indeed, certainly within half an hour. In those tissue-culture experiments with herpes one type of experiment brought out two important points—first, the speed with which virus can attack cells; secondly, the fact that the immune serum cannot inactivate virus which has run for shelter to the safe harbour of the inside of a cell. Herpes virus was added to a culture of normal cells and immune serum was added half an hour later. It was too late; the virus had had time to invade the cells and proceeded to go ahead and multiply and form the typical inclusion bodies in spite of the antibodies which were now bathing the outside of the cell. Control experiments showed that the virus could never gain a foothold in the cell if the antibody was on the spot in time. Experiments on the living animal show the same thing. Immune serum can be put intradermally into a rabbit's skin and the exact spot marked. Virus inoculated into that exact spot five minutes later can produce no lesion. But if the virus is introduced five minutes before the serum it *can* produce a lesion; though it is true that this will be much smaller than that in a control site where no immune serum is injected. Here, again, the virus gets to work very quickly; the serum has got to be there first to do much good.

This sort of experiment has an obvious bearing on the possibility of serum-therapy in virus infections. It confirms the familiar clinical experience that serum is very potent as a prophylactic in some virus infections, but of much less use as a curative measure. It does not follow, however, that serum can do no good in therapeusis if the virus has once got in and infected a patient; I have suggested that it is probably unable to save a *cell* which the virus has once attacked. It may benefit the *patient* by limiting the number of cells which can be attacked and so controlling the disease. It is in this way that immune serum given during the incubation period of measles probably succeeds in aborting the disease.

HOSPITAL ALMONERS.—The annual report of the Incorporated Institute of Hospital Almoners records the taking possession of new premises in Tavistock-square and that the move has resulted in a great increase of work. The roll of students doubled during the year, and the number of hospitals appointing certificated almoners is steadily increasing. Thirty-nine such appointments have been made and 23 certificates granted, and at the close of the year there were 123 students in training. Lord Moynihan has become President in succession to Lady Bradford, and the council has decided that students without academic qualifications must obtain a University Social Study certificate during their course of training. Selection and advisory committees are already at work in Leeds and Liverpool, and others have been formed at Birmingham and Newcastle. It is hoped to standardise training and fees throughout the country.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

A MIDWIVES BILL.

ON the motion of Mr. R. Mulcahy, Minister for Local Government and Public Health, the Dáil last week gave a second reading to a Midwives Bill designed to amend the Irish Midwives Act, 1918. That Act, the Minister said, had helped to reduce the mortality due to childbirth very considerably, and the mortality for 1929 was the lowest in the records of the country—namely, 4·1 deaths per 1000 births. The average for the preceding ten years had been 4·88 per 1000. There were, however, certain loopholes in the Act of 1918, which it was now intended to close. Under the Bill any unqualified person who attended a woman in childbirth, unless such person could satisfy the Court that such attention was given in case of sudden and urgent necessity, would be guilty of an offence. Several deputies, of whom three were dispensary medical officers, drew attention to the low salaries paid to midwives employed in the poor-law service. It was also pointed out that, with the abolition of the "handy-woman," steps must be taken to increase the number of qualified midwives in the country, or there would be a shortage of service.

"OPTICAL BENEFIT."

Serious objection was taken on behalf of the medical profession last year to the methods sanctioned by the National Health Insurance Commission in the Irish Free State for the administration of the "optical benefit." This benefit, for which certain approved societies made provision, supplied glasses to members who required them, and the glasses were given on the advice of opticians, without any medical examination of the recipient or medical prescription. It was pointed out to the Commission at the time that such a practice involved two dangers. The absence of medical examination of those who complained of defective eyesight rendered it likely that many grave diseases of the eye would be overlooked, and their symptoms cloaked until serious damage had been done. On the other hand, the opticians were not slow to boast that their status had received the recognition of a Department of State, and the public were misled into thinking that opticians were a qualified class. It is now recognised by the Commission that these objections had substance in them, and it has been arranged that in future glasses will be supplied only on the prescription of a recognised ophthalmic surgeon. Arrangements have been made by which the services of ophthalmic surgeons will be available in all parts of the country.

COUNTY MEDICAL OFFICERS OF HEALTH.

In the Dáil last week, in answer to a question, the Minister for Local Government and Public Health was able to announce that county medical officers of health had now been appointed in 17 out of 26 counties in the Irish Free State. These counties are Carlow, Cavan, Cork, Donegal, Galway, Kerry, Kildare, Limerick, Louth, Mayo, Meath, Monaghan, Offaly, Roscommon, West Meath, Wicklow, and Wexford. In addition, there are three assistant medical officers of health in Cork, two in Donegal, and one in Galway.

THE BRITI at all ICAL ASSOCIATION AND DUBLIN.

The Leins union m. of the British Medical Association has alr suggestion, ts preparations for the annual and serum a meeting of the Association which is to be held in Dublin in 1933. The branch council has the cordial support of the Minister for Local Government and Public Health and of the Executive Council of the Irish Free State. The municipality of Dublin, through its Lord Mayor, Mr. Alfred Byrne, has also promised support, and the Lord Mayor has kindly offered the hospitality of the Mansion House for the use of the committees engaged in the arrangements for the meeting. The Universities and the Royal Colleges are also coöperating cordially, and no doubt will be equally ready to offer the hospitality of their buildings and premises. On April 15th a preliminary meeting of the profession of the Province of Leinster, together with representatives of various public bodies and many prominent laymen, was held in the Royal College of Surgeons, Dublin, to take the first steps toward organisation. The President of the Leinster branch, Prof. T. G. Moorhead, who is also President of the Royal College of Surgeons, was in the chair, and sketched the outlines of the necessary organisation. After him the Lord Mayor of Dublin was the principal speaker.

MEDICINE AND THE LAW.

Use of Quinine by Midwife to Induce Labour.

THE East Suffolk coroner lately held an inquest upon the death of a young married woman at Lowestoft. The jury found that the cause of death was hæmorrhage supervening upon the birth of her first child. The evidence, not disputed, was that a midwife had administered quinine to induce labour. She did this without medical supervision, using a prescription which a medical practitioner had employed in another case in which she had been engaged; he had told her that she could use the prescription at any time if she thought it necessary and that he regarded the treatment as absolutely safe. In answer to Dr. D. W. Boswell, the midwife admitted that it was not usual for the nurse to induce labour without consulting a doctor; she was not aware at the moment that she was giving the patient grs. 40 quinine; she had no idea of the amount. She did not realise at the time that she was breaking the rules of the Central Midwives Board. She admitted that Rule 19 forbade her administering medicine unless a note of it was put in the register; she had made no such entry in her register, but intended to do so later. The practitioner who had given the prescription stated that he had discussed with the midwife the safety of the method. When he told her she might use the prescription, he did not know that the rules forbade her giving anything but an aperient or ergot. In answer to the coroner he dealt with the amount of quinine which could safely be used. When using quinine in these circumstances he had known no case of post-partum hæmorrhage. Dr. Boswell, asked by the coroner, said it was recorded that quinine did occasionally produce serious hæmorrhage. In his summing-up to the jury, the coroner pointed out that there was not sufficient evidence to justify attributing the hæmorrhage to the administration of quinine. There was no question of a verdict of manslaughter, for the midwife had naturally believed and relied upon what a qualified doctor told her. The jury added to the verdict, already mentioned above, the rider that artificial induction of labour should only be produced under the strict supervision of a duly qualified medical practitioner. This opinion had already been expressed in his evidence by Dr. Boswell who explained that the prescription was a recognised method used in hospitals, but under strict medical supervision.

Breach of its rules is a matter which can be left to the Central Midwives Board to deal with. The midwife whose conduct formed the subject of the inquiry gave her evidence with frankness; she had eight years' working experience; more than one practitioner testified to her ability, and the jury's verdict absolves her. Two general observations may perhaps be added. Midwives who observe a treatment successfully applied by a doctor to one patient should not assume too readily that they themselves can safely apply it to other patients without supervision; secondly, prescriptions are not meant to be circulated like library books, least of all when a breach of the Central Midwives Board's rules is involved.

PUBLIC HEALTH SERVICES

PAYMENT FOR ACCIDENT CASES AT HOSPITALS.

UNDER Section 36 (2) of the Road Traffic Act, 1930, where any payment is made in respect of the death of or bodily injury to any person arising out of the use of a motor vehicle on a road, a sum not exceeding £25 shall be paid to cover reasonable expenses at the hospital where treatment has been given, provided that no charge has been made. Mr. W. Taylor, chief public assistance officer to the Surrey County Council, points out that the numerous accident cases admitted to Surrey municipal hospitals fall into two classes: (a) those belonging to the county, and (b) those who have a fixed place of abode in some other county or county borough. He suggests that all assistance granted to class (a) should be "on loan" under the provisions of Section 49 of the Poor Law Act, 1930. Each case reported to him would be considered on its merits, and in cases of probable long duration it might be advisable to make a charge and not a claim on the authorised insurer. Class (b) cases he would deal with under Section 80 of the Poor Law Act, 1930, which provides that the county or county borough in which they have a fixed place of abode should reimburse the council in full in respect of treatment. Credit would be given for moneys recovered from the authorised insurer. Such an arrangement would be a mutual one with other counties and county boroughs.

The Surrey Council has decided to adopt the procedure suggested by Mr. Taylor for a period of six months.

UNSOUND FOOD GIVEN AWAY AS PRIZES.

AT a meeting of the Metropolitan Boroughs Standing Joint Committee it was reported that unsound chocolates had been given away as a prize for a winning ticket at a recent entertainment in Islington. As a result of a visit paid to the stall by officials of the local authority, several hundred boxes of chocolates were surrendered as unfit for food and subsequently removed for destruction. The Metropolitan Branch Council of the Society of M.O.H.'s believes that a considerable amount of food is distributed in this way; complaints of unwholesomeness have from time to time arisen, but as the goods are not exposed or deposited for sale, Section 47 of the Public Health (London) Act, 1891, does not apply. The health committee of the Stoke Newington Borough Council is asking the London County Council to promote legislation, by means of a clause in a General Powers Bill, requiring that food given away as prizes or by tradesmen as gifts should, if intended for human consumption, be regarded as food exposed for sale under the section of the Public Health Act above mentioned.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED APRIL 18TH, 1931.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 163; scarlet fever, 1376; diphtheria, 880; enteric fever, 36; pneumonia, 1313; puerperal fever, 45; puerperal pyrexia, 122; cerebro-spinal fever, 83; acute poliomyelitis, 5; acute polio-encephalitis, 2; encephalitis lethargica, 21; dysentery, 6; ophthalmia neonatorum, 131. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on April 21st–22nd was as follows: Small-pox, 208 under treatment, 8 under observation (last week 190 and 7 respectively); scarlet fever, 1234; diphtheria, 1568; enteric fever, 26; measles, 146; whooping-cough, 432; puerperal fever, 29 (plus 15 babies); encephalitis lethargica, 129; poliomyelitis, 2; "other diseases," 182. At St. Margaret's Hospital there were 19 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 4 (1) from enteric fever, 55 (0) from measles, 4 (1) from scarlet fever, 34 (4) from whooping-cough, 35 (10) from diphtheria, 36 (7) from diarrhœa and enteritis under two years, and 110 (11) from influenza. The figures in parentheses are those for London itself.

The deaths from enteric fever occurred in Exeter, Nottingham, and Bradford. Eight deaths from meningococcal meningitis occurred in London, 4 under 1 year, 1 each from 1–2 years, 5–15, 15–25, and 25–35 years. Twelve fatal cases of measles were reported from Birmingham, 7 from Sunderland, 6 from Liverpool. Leeds reported 4 deaths from whooping-cough. Diphtheria claimed 9 victims at Liverpool, 4 at Birmingham. The 99 fatal cases of influenza outside London are scattered over 54 great towns: 9 were reported from Birmingham, 5 from Leeds, and 4 from Croydon.

The number of stillbirths notified during the week was 305 (corresponding to a rate of 42 per 1000 births), including 44 in London.

LANCASTER JOINT HOSPITAL DISTRICT.—Lancaster town council is applying to the Ministry of Health for a Provisional Order forming the boroughs of Lancaster and Morecambe and Heysham, and the urban district of Carnforth, into a united district to be called "The Lancaster and and District Joint Hospital District" for the provision, maintenance, and management, for the use of the inhabitants of the joint district, of hospitals for the reception of cases of infectious disease, including small-pox.

MIDDLESEX HOSPITAL.—The report for 1930 was adopted at a court of governors recently. The number of patients admitted during the year (471 beds) was 6751, and their average weekly cost £5 4*s.* 1*d.* The average stay was 22·40 days and the total cost of each patient was £16 14*s.* 4*d.* The number of new out-patients was 52,118, and the attendances, which numbered 234,869, showed a marked increase. With more beds opened and a larger out-patient department to maintain, the expenditure amounted to £129,967. The income, thanks chiefly to some large legacies, was £141,602, leaving a credit balance of £11,635. Prince Arthur of Connaught, who presided at the meeting, said that the reconstruction scheme is nearing completion, but that the money in hand is sufficient only to cover the cost of the framework, leaving approximately £245,000 to be found to finish the work.

CORRESPONDENCE

THE POST-GRADUATE HOSPITAL AND SCHOOL.

To the Editor of THE LANCET.

SIR,—In his letter last week "Simplicitas" states his case in a simple and restrained manner as befits his pseudonym. His doubts arise from the fact that the great object which the Ministry of Health has in view is to provide an efficient medical service under the National Health Insurance Act, and the doctors involved are those working under that Act. The Ministry is not primarily concerned with post-graduate education of the whole medical profession in the country and not at all with post-graduate education of the medical profession of the Empire. The proposals to provide a large post-graduate hospital on the lines of Vienna are far wider in their bearings than the actual needs of the Ministry.

Now it is quite obvious that the needs of the Ministry are urgent and as a considerable amount of time must elapse before a post-graduate hospital envisaged in the proposals which have been published can come into effect, it would be well if existing facilities were fully used. London is already well provided for as far as the Ministry is concerned. The Fellowship of Medicine would, I feel sure, be glad to coöperate, and at the West London Hospital every facility is already obtainable. Even now arrangements are being made with local national health insurance committees in several districts for their members to attend the West London, but the hospital practice is capable of being more widely used in this way.

I am, Sir, yours faithfully,

HENRY SIMSON,
Dean of the West London Hospital Post-Graduate College.

April 31st, 1931.

To the Editor of THE LANCET.

SIR,—It is, as "Simplicitas" says, "a splendid thing that a great post-graduate centre is to commence its activities in the metropolis," and it is to be hoped that the difficulties he mentions will not be formidable. In an English undergraduate school the student is taught new methods of diagnosis and treatment, and by the time he has finished his course he has had opportunities of practising them himself, having been shown how to do so under expert example and instruction. The same will apply to the post-graduate except that, having already learned what was taught in his day, he will be in the position of a senior undergraduate and will therefore be able forthwith to begin the study of new methods.

The difficulty which the English doctor finds in getting away is not insuperable; it will at any rate be easier for him to go to London than to Vienna. There are many post-graduate centres in Great Britain now. One is the Fellowship of Medicine. Last year considerably over 600 post-graduates took out the courses it offers; more than half of these came from Great Britain, most of them in general practice. As these figures are from one post-graduate centre only, the total number of practitioners in Great Britain taking post-graduate courses must have been large. They managed it somehow by getting a partner to do their work or by a locum tenens, just as others succeeded in obtaining a holiday.

I am, Sir, yours faithfully,

April 25th, 1931. W. HALE-WHITE.

To the Editor of THE LANCET.

SIR,—"Simplicitas" lays stress upon the difficulties of practitioners leaving their practices in order to undergo a course of post-graduate instruction. These difficulties can be overcome by adopting such a system as the holiday locum scheme run by the panel committee in connexion with practitioners on the London panel. By this scheme groups of doctors, varying in number from four to eight, arrange to act as locums for each other during absence on holiday. Each doctor pays into a pool five guineas for each week he is away, and his patients are given the list of members of the group to choose from when needing attendance. Payment out of the pool is made on the case value system, each individual patient (not each attendance) counting as one unit. In the case of practitioners on the panel the clerical work is undertaken by the panel committee. It should surely not present insuperable difficulties to arrange similar groups among other members of the profession.

I am, Sir, yours faithfully,

C. LUTHER BATTESON,
Medical Secretary, Panel Committee for the County of London.

Russell-square, W.C., April 28th, 1931.

INCUBATION PERIOD IN EPIDEMIC CATARRHAL JAUNDICE.

To the Editor of THE LANCET.

SIR,—I have read with great interest the account of an epidemic of catarrhal jaundice by Dr. J. Alison Glover and Dr. Joyce Wilson in your issue of March 28th (p. 722). There appears to be unanimity among recent writers as to its respiratory spread, but the above authors estimate the incubation period at about four days, a widely different view of the incubation period from that taken by Dr. W. G. Booth[1] and myself.[2] Personally I found it easier to trace the course of infection when the cases were few than when, as in the larger villages, great numbers of cases occurred. Surely a scattered country district gives a better opportunity of arriving at an incubation period than a school in which the cases come thick and fast, and it is impossible to say which case infected which.

I do not presume to explain the incidence of the cases in the later epidemic, beyond pointing out that the hiatus recorded in the authors' diagram from June 9th to July 13th, and also the case of the "little girl who developed icterus 20 days after leaving the town," suggest a long incubation period. But I should like to repeat in full the following striking sequence, which was outlined in my own paper, and which is strong evidence in favour of an incubation period of about a month. This is only one of several chains which occurred in the Wensleydale epidemic.

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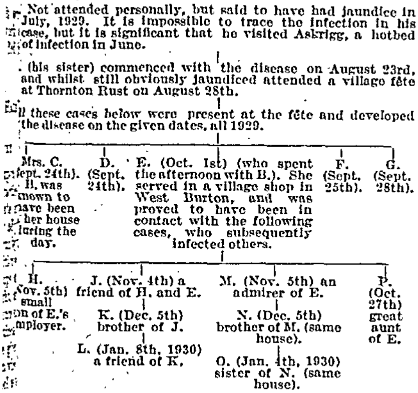
[1] Public Health, May, 1928.
[2] Brit. Med. Jour., 1930, i., 944.

ad which all support the claim of an incubation eriod of the same duration.


Not attended personally, but said to have had jaundice in July, 1929. It is impossible to trace the infection in his case, but it is significant that he visited Askrigg, a hotbed of infection in June.
. (his sister) commenced with the disease on August 23rd, and whilst still obviously jaundiced attended a village fête at Thornton Rust on August 28th.
ll these cases below were present at the fête and developed the disease on the given dates, all 1929.
Mrs. C. ept. 24th). B. was nown to ave been her house luring the day.
D. (Sept. 24th).
E. (Oct. 1st) (who spent the afternoon with B.). She served in a village shop in West Burton, and was proved to have been in contact with the following cases, who subsequently infected others.
F. (Sept. 25th).
G. (Sept. 28th).
H. Nov. 5th) small on of E.'s mployer.
J. (Nov. 4th) a friend of H. and E.
K. (Dec. 5th) brother of J.
L. (Jan. 8th, 1930) a friend of K.
M. (Nov. 5th) an admirer of E.
N. (Dec. 5th) brother of M. (same house).
O. (Jan. 4th, 1930) sister of N. (same house).
P. (Oct. 27th) great aunt of E.

These cases are the only ones which occurred in Vest Burton throughout the whole epidemic.

I am, Sir, yours faithfully,

W. N. PICKLES.

Aysgarth, Yorkshire, April 25th, 1931.

TREATMENT OF FUNCTIONAL ANOREXIA.

To the Editor of THE LANCET.

SIR,—It would be a pity to allow the paper in 'our last issue by Dr. Allison and Dr. Davies to go nremarked; for it places an emphasis that seems to ne unfortunate upon the dietetic and medicinal reatment of an important condition. Anorexia ervosa as originally described by Gull cannot be so are as they suggest; since T. A. Ross and R. Hutchison irst interested me in it I have seen two or three ases each year, without going out of my way to ook for them. It is often confused with mere loss f appetite in other conditions such as mental epression, but anorexia nervosa in the classical ense presents a clinical picture which is simply nmistakable, and in most cases curable as far as the ymptoms are concerned, not by elaborate dietary, ut by simple insistence on a sufficient intake of ood. The patients are nearly always young women I have not yet seen the symptoms in pure culture n a man) and unmarried. They complain (if you sk them, for they are usually brought by their elatives) of lack of appetite and amenorrhœa but of othing else; and they are more or less emaciated ut show no sign of organic disease. They are isually leading, if permitted, an ordinary life with pparent cheerfulness and apparently normal mentality n spite of a minimal intake of food which may ltimately reach vanishing point. Commonly they re at loggerheads with their family on the question f their nutrition.

Treatment consists essentially in removal from their family and isolation from visits and from correspondence; and in insisting that whatever they are given to eat must be eaten. To ensure this a reliable nurse is placed in charge with instructions to see that every feed is completely consumed. No special diet and no elaborate calculation of *calories* need be undertaken. The commencing diet should be only slightly in excess of that to which the patient has reduced herself; but it should be rapidly increased and by the third week dissatisfaction is expressed if a gain of five or six pounds a week has not by that time been reached. Bitter tonics, acid, insulin, thyroid, and gastric lavage are all alike superfluous. If the stomach has been labelled "atonic" or "dropped," some work to do, and some omental fat to lie on, will accomplish all that is necessary.

Although the condition has undoubtedly a psychological basis the above régime should be begun at once, and psychological exploration should not go deep at least till after food is being taken normally.

There are many other points of interest and importance both clinical and therapeutic but they would unduly expand a letter. In brief, régime and not minutiæ of diet such as are so ably described by Dr. Allison and Dr. Davies, is the important thing. If this is not realised it becomes much more difficult to restore these patients to health. These remarks of mine, however, do not apply to many varieties of illness often but erroneously labelled anorexia nervosa which are really examples of hypochondria, psychotic depression and the like.

I am, Sir, yours faithfully,

R. D. GILLESPIE.

Wimpole-street, W., April 27th, 1931.

SYPHILIS AND YAWS.

To the Editor of THE LANCET.

SIR,—The relationship of syphilis and yaws presents a problem of the greatest interest to those who have studied the latter disease but one to which the majority of your readers may have given little thought. Captain Butler in your last issue animadverts upon the common facts that many statements are repeated in medical literature which are not true or which are no longer accepted by the bulk of medical opinion. Among these he would place the view that yaws and syphilis are separate disease entities, and he boldy exclaims "to-day it is possible to say that yaws is purely *an artefact erected over* the disease syphilis. This statement is made with the hope that some 'dualist' will produce evidence to the contrary. There has been ample time for all such evidence to assert itself." He points out that "since the time of Sydenham and long before him there have been English and Continental observers who thought and *taught correctly about framboesia.* Berkeley Hill of English and E. Lancereaux of French physicians have shown how completely the yaws syndrome is identified with syphilis." I cannot help thinking that Captain Butler has been most unhappy in drawing inspiration from these two writers. Both wrote treatises upon syphilis, but neither had any *first-hand* knowledge of yaws, and in respect of this disease are guilty of that same fault in their writings of which Captain Butler complains. Their opinions were based upon the writings of others (Paulet for example) which they failed to interpret correctly. Their opinions upon yaws are absolutely valueless as will be apparent to anyone *conversant* with the older writers on framboesia. Lancereaux was not even aware that the words pian and yaws referred to the same lesion, and Hill says of sibbens (a non-venereal epidemic syphilis) that it much resembles yaws, a statement which is quite untrue.

Not very much has actually been written upon the unity or duality of these two diseases but (without entering the ranks of the duellists to cross swords with Captain Butler) I think it should be stated, lest Captain Butler's statement be given undue credence, that for the majority of those able to judge, yaws as a disease entity has appeared to withstand the onslaught of Captain Butler and others who hold opinions similar to his own. I think, moreover, that the dualists might quite fairly take up the opposite stand and express the view that the onus lay with Captain Butler to prove them wrong. As a non-partizan onlooker and without attempting to open a discussion I imagine he would be required to explain why no single case of absolutely undoubted syphilis has ever exhibited the typical pathognomonic florid eruption characteristic of yaws vouched for by an authority on frambœsia.

I am, Sir, yours faithfully,
HUGH STANNUS STANNUS.

Wimpole-street, W., April 25th, 1931.

DUROCAINE IN SPINAL ANÆSTHESIA.

To the Editor of THE LANCET.

SIR,—In the current issue of the *British Journal of Anæsthesia* Dr. Bernard Johnson describes his practice with durocaine, a pseudo-hypobaric solution of novocain. He puts the patient in the reverse Trendelenburg position after injection with the idea of spreading the drug upward over the roots. He says:

> "In these cases it is usual to find that the lower limbs and the lower third of the abdomen become anæsthetised in about six minutes and that the remainder of the abdomen and lower thorax suddenly become anæsthetised after a varying period of time. It has been the writer's practice always to tilt the table to some degree of Trendelenburg position 15 minutes after the injection has been made. The reason for this delay cannot yet be stated, but it is probably due to some anatomical condition delaying the absorption of the anæsthetic."

In other words the novocain will not go up hill, but waits for the Trendelenburg position, for this mixture becomes a hyperbaric solution when diluted with cerebro-spinal fluid.

He injects 200 mg. of novocain into the spine of a child of 6 and up to 400 mg. in other cases.

> "In both these cases one, a child of 6 years who was given 2 c.c. of anæsthetic solution making it up to 3 c.c. with cerebro-spinal fluid, and the other an elderly fat woman with some myocardial degeneration, the respiration became snatching and no pulse could be felt at the wrist or in the preauricular division of the superficial temporal artery; the common carotid artery could just be felt; the eyes rolled upwards; there was extreme pallor of the face and lips, and in fact the picture was of imminent death."

Later he says: "In regard to the toxicity of the solution, it can only be said that no toxic symptoms were detected in any of the cases." It would be interesting to know what would be accepted as good evidence of poisoning in this clinic, for an upward trend of the eyeballs is usually regarded with apprehension even in lay circles.

Koster's theory is entirely invalid, based on the fallacy of direct medullary action, and false deduction from experiments on small batrachians and not much larger mammals. The respiratory centre can be paralysed with as much certainty by an overdose of novocain as it can be with chloroform. In the cases quoted it was badly affected as evidenced by the "snatching" respiration. It is difficult to understand how so improbable a theory could have gained so much ready acceptance. Before Koster and Pitkin clouded the issue with untenable and unscientific theories, Labat's dosage of novocain up to 150 mg. was accepted as a maximum requirement, and this should only be exceeded in heavyweight patients with long spines. Labat is now making a similar protest. An injection of 200 mg. into a child of should elevate the eyebrows of the onlooker as w as the eyeballs of the patient, for such dosage i beyond all reason. After such a recital is there need to contest the competence of gliadine to prev blood absorption?

Gum solutions were tried a generation ago a abandoned.

I propose to elaborate the proofs of my statemen at Eastbourne in July, but in the meantime so criticism seems to be called for.

I am, Sir, yours faithfully,
W. HOWARD JONES.

London, W., April 27th, 1931.

INSULIN AND PRESERVATIVE.

To the Editor of THE LANCET.

SIR,—We have been told that the Ministry Health intends introducing a Bill which wo necessitate the addition of antiseptic to those t peutic substances which are administered by inje into the tissues, when sold in containers from wh more than one dose has to be extracted. The val of such a regulation may appeal to some in the ca of sera and other fluids which form excellent cultu media for micro-organisms introduced accidentl and it will be remembered that the report of th commission which investigated the Bundabe disaster advocated this step in the case of a mixtu of diphtheria toxin and antitoxin.

However we would urge that there should be th most careful consideration and balancing of evide before insulin is included in such a regulation. I the case of sera which are administered very infr quently to a patient, the simultaneous administratio of a small amount of antiseptic can be of no cons quence; but it must be remembered that insul patients may be injecting themselves three times day for years and it would be rash to assert that th daily administration of a small dose of antiseptic such as tricresol, may not have some deleteriou action in the course of years. Some little time ago law was passed which made it illegal to poison th inhabitants of Great Britain by giving them smal doses of food preservatives, and it would certainl be illogical to make it obligatory for diabetics in th country to give themselves small doses of pois two or three times a day continuously.

Of course if cases of sepsis follow from the adminis tration of insulin which does not contain a preserva tive, the matter would be different, and one of o objects in writing this letter is to find out what ha been the experience of others in this connexio We would urge that further inquiries should be ma in all countries where insulin free from antisepti has been used and, only if evidence that cases o sepsis follow its use be obtained, that its sale in th country should be forbidden. The question al arises as to whether an ordinary solution of insuli is a suitable culture medium for extraneous bacteri provided the syringe and needle have not bee sterilised in alkali, which if introduced into th container might reduce the acidity of the insuli solution, but would lead to turbidity.

A precaution that might quite well be taken wou be to insist on this insulin being packed in colourles bottles and accompanied by instructions that, if th insulin does not look like perfectly clean water, i should not be used.

We are, Sir, yours faithfully,
O. LEYTON,
E. P. POULTON.

London, W., April 27th, 1931.

UNDULANT FEVER IN SHIPS.

To the Editor of THE LANCET.

SIR,—Surgeon-Captain Dudley will perhaps allow me to thank him for clearing up the diagnosis of "*Thalia* fever" After learning that enteric was not caused by dirt unless the dirt was infected by the specific bacillus, I had often wondered whence came the germ of the pyrexia in stuffy ships; I had not allowed for carriers. Surgeon-Captain Dudley explains that fever as due to overcrowding, with brucella infection superadded. This view, however, seemed to me excluded by the long incubation, the "spleen generally normal," and other clinical difficulties. But if we look on overcrowding as the special box, and the carrier as the match which sets the epidemic alight, ship epidemics like those in the *Thalia* in 1883 and the *Seaflower* in 1882 become intelligible. What is now wanted is an agglutination test of catarrhal and bronchitic cases in the Mediterranean to prove that brucella infection is prevalent, though no infected milk is drunk.

I would like to submit that, assuming that undulant fever in the Navy first appeared in the *Hannibal* and other ships at the time of the Crimean war, perhaps it came from the Crimea. Now that it can be exactly diagnosed by agglutination, the fever is always being reported from the east end of the Black Sea, from Azerbaijan, Armenia, Batoum, and quite lately[1] by Rudnew and Krumberg, from Rostoff-on-Don, at the top of the Sea of Azof, quite close to the Crimean Peninsula. May it not have existed there unrecognised in 1854? I am, Sir, yours faithfully,

W. E. HOME.

April 25th, 1931.

THE LATE MARGARET McMILLAN.

To the Editor of THE LANCET.

SIR,—I have been entrusted with the task of writing a record of the life and work of the late Margaret McMillan. It will assist materially if any of your readers will send to me any important letters, papers, or pamphlets they may possess. Personal memories would be most helpful. All documents will be returned in due course.

I am, Sir, yours faithfully,

ALBERT MANSBRIDGE.

38, High Oaks-road, Welwyn Garden City, Hertfordshire.
April 21st, 1931.

A SIMPLE METHOD FOR BLOOD CULTURE.

To the Editor of THE LANCET.

SIR,—With reference to Dr. Burnet's letter in your issue of March 28th (p. 729), I wish to state that I was not aware of the existence of a similar device. The essential part of my apparatus is the use of the Viskap which keeps the cap sterile until ready for use, and this, as far as I know, has not previously been used for the purpose described. I have examined the specification and I find that Dr. Burnet's patent No. 187900/22 is limited to a washer which consists of a layer of spongy rubber interposed between two ordinary impermeable rubber discs. As the apparatus described by me contains only a single rubber disc I am advised that anyone is entitled to use it without infringing any patent.

I am, Sir, yours faithfully,

J. E. McCARTNEY.

Southern Group Laboratory, Park Hospital,
Hither Green, S.E., April 27th, 1931.

TUBERCULIN-TESTING OF MILCH COWS.

To the Editor of THE LANCET.

SIR,—There appears to be a general impression that a large number of the cattle in tuberculin-tested herds react to the prescribed six-monthly test. This is not a fact. The figures on this farm, which is an ordinary dairy farm milking 80 cows and producing certified milk, are as follows. The herd was started in 1918 and the double intradermal test has been employed since this method was in general practice. Previously to this the subcutaneous test was carried out, but the former has undoubtedly proved the more efficient for the purpose of eliminating tuberculosis. It is, therefore, on the use of this test that these remarks are based.

In March, 1928, a licence for certified milk was taken out, and this demands a test every six months. The half-yearly tests have included all the cows in milk, dry cows, bulls, and in-calf heifers likely to come into the herd during the subsequent six months. These have averaged 120 for each half-yearly test. For two years we had not a single reactor, that is until March, 1930, when, owing to the fact that we were having a sale of a considerable portion of the pedigree stock because of lack of accommodation, all animals over ten months were tested, making a total of 156. Of this number, five failed to pass the test. One was a bought-in cow and the others were all first calf heifers. These heifers were known to have been in accidental contact with one or two possible sources of infection. In September, 1930, 106 animals were tested, and there was one reactor—a bought-in cow. In March, 1931, we had three reactors out of 120 animals tested. All three had been bought in since September, after passing the test. These reactors were in splendid condition, with no signs whatever of diseased udders.

If a herd is freed from tuberculosis, if no new animals are imported into the herd, and if there is no chance of contact with others not known to be free from disease, there is practically no risk of re-infecting the herd, providing that care is taken when purchasing hay and straw from other farms to ascertain that cattle have not had access to it, and that the water-supply is free from all possibilities of contamination.

I am, Sir, yours faithfully,

L. A. FOOT.

Hamberlins Farm, Northchurch, Berkhamsted.
April 22nd, 1931.

ROYAL VICTORIA HOSPITAL, BELFAST.—The annual meeting of this hospital was held on March 25th with the Duchess of Abercorn in the chair. The total admissions to the wards in 1930 amounted to 5947; new cases to the extern department numbered 55,665; the total attendance of old cases registered was 99,069. The observation wards were of great service; 1557 cases were treated there, of which 246 were subsequently admitted to the wards. The disbursements for the year were £61,894, and the receipts £60,775. A gratifying feature of the revenue account was the steadily increasing contributions from workpeople, which in spite of adverse trade conditions show an advance of £1408, realising the total of £25,327. A considerable amount of dissatisfaction was expressed that the National Radium Trust and the Radium Commission have not extended the distribution of radium on loan to hospitals in Northern Ireland, although the Royal Victoria Hospital fulfils all the conditions laid down for the formation of a radium centre. However, the hospital is developing a radium centre for Northern Ireland on the same lines as prescribed by the Commission in Britain, and through the generosity of the Viscountess Pirrie, and a few anonymous donors, a stock of radium valued at £3314 has been supplied. To supplement this the board has obtained a special loan of £4000 for the purchase of further radium, and delivery is expected in a few weeks. It is hoped that donations will be forthcoming to the radium fund to wipe out this indebtedness.

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[1] Arch. f. Schiffs- u. Tropen-Hygiene, February, 1931, p. 81.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

HOUSING (RURAL WORKERS) AMENDMENT BILL.

ON April 21st in the House of Commons Mr. ADAMSON (Secretary of State for Scotland) moved the second reading of the Housing (Rural Workers) Amendment Bill. He said that the object of the measure was to extend for a further period of five years the Housing (Rural Workers) Act, 1926. The principal Act arose out of representations by local authorities in rural areas to the effect that the grants for the erection of new houses were not wholly suitable to the circumstances of those areas. The local authorities urged that what was required was a grant towards the expenses of reconstruction and improvement of existing houses for farm workers and other persons of similar economic condition, the problem in many rural areas being not so much that there was a shortage of houses as that the existing houses required to be modernised and supplied with the recognised conveniences. Considerable advantage had been taken of the provisions of the Act of 1926, and it had been the means of providing improved and healthier housing accommodation for a large number of rural workers. Much of the work which had been done under the Act had consisted of the introduction of water, baths, and w.c.'s into houses; the provision of sculleries; the renewal of defective roofs and floors; the adoption of measures to do away with dampness, and the provision of larger windows to permit of better lighting and ventilation. The average grant given by Scottish local authorities had worked out in the course of five years at £86 per house, and in England the corresponding figure was £78 per house. Towards these grants the Exchequer contributed one-half in the form of an annual payment spread over a period of 20 years. Of the 33 county councils in Scotland, 32 had had schemes of assistance approved, and the remaining one had decided to adopt a scheme. In addition, schemes had been approved from 28 burghs. In England, he was informed, schemes had been approved from 297 authorities, including 46 county councils and 146 rural district councils.

Mr. GREENWOOD (Minister of Health) said when the Act of 1926 was being passed he did not believe, and he never had believed, that this method would prove to be acceptable on a very large scale to the local authorities of the country, but in so far as it could be used to make a practical contribution to the solution of the housing problem in rural areas, he thought the Government ought to give it their support. He had done what had been possible to encourage the adoption of the 1926 Act during the past few years, but he had been disappointed with the results. He had been induced to back a Bill for the extension of the 1926 Act because of the relative success it had met with in Scotland. For what it was worth, and within its narrow limitations, he hoped that the Act would be continued and that it might be more fully used.

SANIFYING OLD COTTAGES.

Lieut.-Colonel FREMANTLE said that this was one of the measures which showed the line along which they could usefully proceed in agricultural districts. The other view was that they should sweep away the old and get the new and the very best. As a medical officer of health he had heard people who were enthusiastic for good housing suggest that the old houses in villages should be swept away, and new ones built in their place, but he felt that that would involve a great deal of unnecessary waste. Cottages built in the middle of the last century were not up to date, but they could be made useful and sound by a certain measure of reconstruction. It must be bold reconstruction, and the 1926 Act provided for that. It was by an extension of that Act that they would be able to cope with the housing problem in rural areas. He was glad that the Labour Government had been converted to the usefulness of the measure passed by the late Conservative Government.

Major ELLIOT said that those who introduced the 1926 Act were only too pleased that it had now found favour in the eyes of some of its bitterest critics, and they were only too glad to support a Bill extending it for another five years.

After further debate the Bill was read a second time without a division.

SICK AND INFIRM VOTERS AT ELECTIONS

On April 22nd the House of Commons went into Committee on the Representation of the People (No. 2) Bill. Sir R. YOUNG (Chairman of Committees) was in the chair.

On Clause 6 (Restriction on the use of vehicles at Parliamentary elections) Major ELLIOT moved an amendment to insert the following: "Provided that nothing contained in this section shall, subject to the provisions of the Corrupt and Illegal Practices Prevention Act, 1883, prohibit any person from conveying to the poll any elector who by reason of age, bodily infirmity, or other incapacity would be unlikely to vote unless conveyed to the poll." He said that it would be agreed that the small number of persons who were covered by this subsection ought to have every possible consideration. They all knew how difficult it was to arrange for cars for these persons who were found in the course of an election to be sick or infirm or liable not to vote unless conveyed to the poll. It was those emergency cases arising on polling day which would be ruled out by the very stringent provisions of this clause unless some step was taken to meet the point. The proposed proviso might not be ideal, but it was an attempt to deal with the situation.

Lieut.-Colonel FREMANTLE said that the probability was that there would be very few motor-cars over which the returning officer would have control, and if, as was frequently the case, in any particular constituency there might be one or more institutions containing between them hundreds of electors who were bodily infirm and unable to go to the poll on foot, the returning officer might not have sufficient motor-cars to accommodate them. There were many electors who would be quite prepared to lend motor-cars to take such people to the poll, but they would not give their cars to the pool under the returning officer. If this proviso was not allowed the Government would be branded in many constituencies with having deprived the sick, the aged, and the infirm of the possibility of exercising their votes.

Mr. CLYNES (Home Secretary) said that he quite admitted that there was something in the idea of the amendment. It might well be that there was in every Parliamentary constituency a group of persons quite unlike the general body of the electors in such a condition of infirmity as to be physically disabled from going to the poll like the rest of the electors and in such a condition as not to feel quite safe going with groups of other people, and who would therefore desire to be conveyed in an ordinary private way by friends of their own who had a motor-car at their disposal. He could assure Major Elliot that the Government would consider the matter sympathetically before the Report stage in order to see if some words could be devised to cover what the hon. Member had in mind.

After further debate, the amendment was negatived by 250 votes to 142.

WORKMEN'S COMPENSATION BILL.

On April 24th the House of Commons passed the third reading of the Workmen's Compensation Bill. This is a measure which has been introduced to deal with difficulties in the law of workmen's compensation which have arisen owing to the judgment of the Courts in the case of Bevan *v.* Nixon's Navigation Company. The effect of that judgment was to cut down materially what had hitherto been regarded as the scope of the Act of 1925 which consolidated the Act of 1923. Up to the time of the Bevan *v.* Nixon decision it was thought that an employer was bound to find work for an injured workman or to provide compensation. The Bill is made retrospective to Jan. 1st, 1924, and under its provisions the Bevan *v.* Nixon's Navigation Company judgment will not apply in respect of cases which happened on or after that date.

THE BUDGET.

In the House of Commons on April 27th Mr. SNOWDEN, the Chancellor of the Exchequer, made his annual Budget statement. In the course of his speech he stated that the estimates of expenditure for 1931–2 totalled £803,366,000, as compared with an estimated revenue of £766,000,000. This left a gap to be bridged of £37,366,000, which was a deficit greater than that of last year's actual deficit of some £14,000,000. This result was mainly accounted for by the need of providing £12,000,000 more for de-rating. Provision had also to be made for £30,000,000 for transitional unemployment benefit. To meet this deficit £20,000,000 would be provided by a reduction of that amount in the exchange account, following the Hague Agreement and the institution of the Bank of International Settlements. In 1931 income tax under Schedules B, D, and E in the case of certain taxpayers, instead of being paid in two equal instalments, would be paid in instalments of three-quarters and one-quarter on Jan. 1st, 1932, and July 1st, 1932, respectively. Taxpayers concerned in this change will be individuals and firms engaged in trades, professions, or husbandry and employees. The result would be that the Exchequer would gain an extra quarter of a year's tax within the current financial year. The estimated yield was £10,000,000. There would also be an increase in the duty on oil from *4d.* to *6d.* as from April 26th. The proposed increase would still leave petrol no dearer than it was before March, 1931, and lower than it was before September, 1930. It would be slightly less than it was after the original *4d.* duty was imposed. It was expected that the increased duty would not appreciably affect consumption. The estimated yield was £7,500,000 in the current year, and over £8,000,000 in a full year. The balance-sheet, therefore, left a nominal margin of £134,000. No provision was made for supplementary estimates. If prosperity returned a margin might be found in an excess yield from taxation above the estimates he had forecasted. Apart from this, gaps would have to be met by economy in national expenditure. Provision would be made in this year's Finance Bill for (*a*) a valuation, and (*b*) the imposition of a tax on land values. It was hoped that the valuation would be completed within two years of the passing of the Bill, and would therefore be available as the basis on which to charge an annual tax for 1933–34 and subsequent years. The tax would be at the rate of 1*d.* per £ of land value.

PHARMACY AND POISONS BILL.

In the House of Lords on April 27th the Pharmacy and Poisons Bill passed through Report.

YARMOUTH NAVAL HOSPITAL BILL.

The Commons amendments to the Yarmouth Naval Hospital Bill were considered and agreed to.

HOUSE OF COMMONS.

WEDNESDAY, APRIL 22ND.

Pensions for Neurasthenia and Shell Shock.

Mr. PRICE asked the Minister of Pensions whether, in view of the effect on the nerves of ex-Service men suffering from shell shock and war neurasthenia of the uncertainty as to the continuance of their pensions, he would consider the question of making these pensions permanent after they had been in receipt of them for the last eight years.—Mr. F. O. ROBERTS replied: Of the total number of pensions in payment for neurasthenia and shell shock about 90 per cent. have already been made permanent. I can assure the hon. Member that the possibility of making final awards in the remaining cases will be constantly kept in view. To make such awards in cases which are not medically suitable for them would not be in the best interests of pensioners generally.

Child Mortality in Hong-Kong.

Mr. GRAHAM WHITE asked the Under Secretary for the Colonies whether, seeing that some official information was available with regard to 1724 out of 1851 dead bodies of children of three years of age and less picked up in the streets of Hong-Kong during 1929, he would call for a report upon the remaining 127 dead bodies; and whether in any case death was due to violence.—Dr. SHIELS replied: Of the 127 bodies, 98 were those of children over three years of age, and 29 were infants of unknown sex. The Governor was requested by my noble friend to state whether in any of the 1851 cases reported for the year 1929 death was due to violence, and he has replied that in no case was there found to be any evidence of violence. In 521 cases of children of three years or under the cause of death was found to be small-pox.

Imported Milk.

Miss PICTON TURBERVILL asked the Minister of Agriculture whether he would inform the House how much per cent. of the milk consumed in Great Britain was imported, showing condensed milk and imported dried milk separately.—Mr. W. PALING (Lord of the Treasury) replied: On the basis of estimates for the years 1924 to 1927, contained in "The Agricultural Output and the Food Supplies of Great Britain," 1929, which are the latest complete figures available, it is calculated that after converting preserved milk into its estimated equivalent in liquid milk, approximately 8 per cent. of the milk consumed in Great Britain is imported, of which condensed milk accounts for rather over 7 per cent., and milk powder for rather under 1 per cent.

THURSDAY, APRIL 23RD.

Standard of Imported Milk Products.

Mr. OSWALD LEWIS asked the Minister of Health whether his attention had been called to the fact that the importation or sale of milk preparations not containing prescribed minims of milk fats was prohibited in 24 countries in the British Empire and in 20 foreign countries; and whether he would consider the desirability of promoting similar legislation in the interests of public health in this country.—Mr. GREENWOOD replied: I am aware of the fact stated, but I do not think it is necessary in the interests of the public health to introduce legislation for this country similar to that referred to.

Mr. LEWIS: Why should we be satisfied with a lower standard in this country?

Mr. GREENWOOD: I am not satisfied that it is a lower standard.

Sir A. STEEL-MAITLAND: If a minimum of butter-fat is prescribed for fresh milk should there not be a minimum for preserved milk?

Mr. GREENWOOD: The point of the question related to public health, and I understand that there is no reason on that account for altering the law.

Rejection of Army Recruits.

Mr. TINKER asked the Minister of Health if he was aware that from October, 1929, to September, 1930, 66,717 men offered themselves for service in the army, and 52 per cent. were rejected on physical grounds; and if his department had done anything to find out what were the physical disabilities, so that steps could be taken to advise the House of Commons on adopting measures to improve the physical standard of our people.—Mr. GREENWOOD replied: I understand that the facts are as stated in the first part of the question. As regards the second part, my department has obtained full information on this subject from the War Office, and it will receive my careful consideration.

Earl WINTERTON: Has the right hon. gentleman seen a manifesto issued by a number of doctors stating as one of the reasons for this deplorable physical condition and these deficiencies as to health and teeth, that they are due to the artificial foods eaten in this over-industralised country; and will the right hon. gentleman have that report considered by the appropriate experts in his department?

Mr. GREENWOOD indicated assent.

Approved Societies and Voluntary Hospitals.

Lieut.-Colonel FREMANTLE asked the Minister of Health the approximate estimated cost of the services rendered by voluntary hospitals to members of approved societies; and what contributions were made by approved societies to the funds of voluntary hospitals in return for such services.—Mr. Greenwood replied: No material is available to enable any estimate to be made of the cost of the services rendered by voluntary hospitals to members of approved societies. The total amount allocated by societies in England in payments to hospitals under schemes consequent upon the second valuation was at the rate of about £300,000 per annum. Schemes based on the third valuation are at present in operation in societies covering only about one-quarter of the total insured population, but under those schemes the annual amount allocated to hospital benefit has been increased by about 14 per cent. above that previously allocated.

Lieut.-Colonel Fremantle asked the Minister of Health if, in view of the fact that last year University College Hospital treated over 2000 members of approved societies at a cost of £22,000, towards which the societies contributed only a little more than £3000, and that of 124 of these societies whose members were admitted to the hospital 44 contributed part of the cost and 80 contributed nothing, he would take steps to bring the claims of the voluntary hospitals to the notice of approved societies in connexion with the allocation of their disposal surpluses.—Mr. Greenwood replied: The attention of all approved societies has already been directed to the provisions of the National Health Insurance Act, under which they are empowered to allocate part of any disposable surplus disclosed on valuation to the making of payments to hospitals in respect of the maintenance and treatment of their members therein.

Lieut.-Colonel Fremantle: Is it not possible for the right hon. gentleman to draw the attention of the societies to the fact, which they probably do not realise, that they are getting very much more from the voluntary hospitals than is covered by the small contributions which they make? I am sure they wish to pay their own way.

Mr. Greenwood: I am prepared to do what I can, but I have no power to enforce it.

Mr. Gossling: Is the right hon. gentleman aware that the great bulk of the workpeople who are compulsorily insured are contributing week by week to the Hospital Saturday Fund.—No answer was given.

Rheumatic Diseases.

Mr. Graham White asked the Minister of Health if, in view of the new efforts being made to combat the evils arising from rheumatic diseases, he would now consider the advisability of setting up an advisory committee on rheumatism on the same lines as the advisory committee on cancer.—Mr. Greenwood replied: I have given careful consideration to this suggestion and have come to the conclusion that I should not be justified at the present time in setting up such a committee as is mentioned in the question.

Factory Medical Officers.

Dr. Hastings asked the Home Secretary the number of persons employed in factories and the number of full-time medical officers in the factory service.—Mr. Short replied: According to the Workmen's Compensation returns for 1929—the last year for which figures are available—the number employed was 5,531,322, including 347,480 outside workers. As regards the latter part of the question, the only whole-time official appointments are the Medical Inspectors of Factories who now number eight. The certifying and other surgeons who are appointed under the Factory Act for particular duties and who number about 1800 are part-time posts.

Veterinary Research Institute.

Mr. Lees asked the Minister of Agriculture whether his attention had been called to the financial situation of the Veterinary Research Institute of Camden Town; and whether he would be prepared to recommend to the Chancellor of the Exchequer that a special grant be given to keep the institute in reasonable efficiency.—Dr. Addison replied: Yes, Sir. I am well aware of the financial position of the Animal Pathology Research Institute attached to the Royal Veterinary College at Camden Town. A scheme for the development and research in animal diseases upon a considerable scale is in an advanced stage of preparation and will, I trust, be sanctioned and brought into operation at no distant date.

Medical and Dental Scholarships.

Dr. Hastings asked the President of the Board of Education whether any maintenance scholarships were provided by his department to secure for children from the secondary schools training for the medical and dental professions.—Mr. Lees-Smith replied: No scholarships provided by the Board of Education are specifically earmarked for students proposing to be trained for the medical and dental professions; but 300 State scholarships are offered annually to pupils from grant-aided secondary schools to enable them to take up courses at Universities for Honours deg including those in Medicine and Dentistry, or preliminary science courses.

MONDAY, APRIL 27TH.

National Health Insurance Funds.

Mr. Grace asked the Minister of Health whether he w *give the figures of the accumulated funds of* appro societies for the last three available years, and the respe amounts which had been invested by or on behalf of appro societies for those years.—Miss Lawrence (Parl. Secretary to the Ministry of Health) replied: The lated funds of approved societies in Great Britain amo to £115,500,000 at Dec. 31st, 1928: £113,000,000 Dec. 31st, 1929; and £114,000,000 at Dec. 31st, 19 The amounts invested by or on behalf of approved have been £1,000,000 for 1928; £1,000,000 for 1930. 1929 investments were realised to the amount of £2,500,

Public Vaccinations.

Mr. Freeman asked the Minister of Health whether would furnish a statement showing the number of vaccinations and re-vaccinations, respectively, carried in England and Wales in each year during the last ten yea and the expenditure incurred out of national and lo funds respectively, together with the number of dea from small-pox during each of the years in question. Mr. Greenwood replied: The following statements these particulars for the last ten years for which compl figures are at present available: (1) Statement showing th number of public vaccinations and re-vaccinations, and th number of deaths from small-pox, in each of the ten yea 1920 to 1929.

Year ended Sept. 30th.	Number of successful primary vaccinations.	Number of successful re-vaccinations.	Deaths from small-pox in the year end Dec. 31st.
1920 ..	258,996	12,898	30
1921 ..	245,154	26,775	5
1922 ..	223,838	12,887	27
1923 ..	415,519	316,641	7
1924 ..	331,522	89,600	13
1925 ..	270,755	40,939	9
1926 ..	279,721	54,221	18
1927 ..	305,005	113,117	47
1928 ..	320,687	163,918	53
1929 ..	258,986	104,397	39

(2) Statement showing for each of the ten years 1919-2 to 1928–29 the total expenditure of *local authorities* o vaccination, the receipts from Government grants, an the balance of the expenditure met out of rates, &c., togeth with the total cost of the Government lymph establishment

Year.	Total expenditure.	Receipts from Government grants.	Balance falling on rates, &c.	Government lymph establishment.*
	£	£	£	£
1919–20	133,265	9,247	124,018	11,973
1920–21	183,789	8,862	174,927	20,091
1921–22	172,558	10,323	162,235	16,211
1922–23	191,416	10,244	181,172	14,489
1923–24	235,677	11,753	223,924	16,553
1924–25	182,077	3,050	179,027	11,205
1925–26	166,255	4,366	161,889	14,439
1926–27	179,066	8,338	170,728	14,356
1927–28	190,754	8,853	181,901	15,321
1928–29	191,643	10,522	181,121	15,377

* Of the total cost of the Government lymph establishme 15 to 20 per cent. in each year is attributable to the cost lymph supplied to the service departments.

Glasgow Ear, Nose and Throat Hospital.—Lord Provost Kelly, presiding at the fifty-first annu general meeting of the hospital, said he was glad for on to be speaking for an institution in which there was n deficit for the preceding year. The new building had onl been opened for four years, but its resources were alread taxed to the utmost and plans were being considered f an immediate further extension. The necessary groun had been obtained through the generosity of an anonymo donor, and funds were now required to provide the buildin It was a sad feature of the work of such a hospital that s many children required treatment; 4602 under 15 yea of age were treated during the previous year, and the were indications that a tremendous amount of work was sti necessary in connexion with child health in Glasgow.

HOSPITAL OUT-PATIENTS.

THE PRACTITIONER'S POINT OF VIEW.

AT a meeting of the St. Pancras Division of the ritish Medical Association on April 28th, Dr. W. A. M. VAN took the chair and explained that the gathering as called to consider the B.M.A. Council's recent port on out-patients.[1] The question vitally affected e general practitioner, whose proper work was being ken from him by the increasing competition of the eat voluntary hospitals. It was impossible for ose hospitals to give adequate treatment or to get e best results from their material and equipment hen they were snowed under by an unmanageable mber of out-patients; neither was time and fficient opportunity given to students to derive the st benefit from the cases. A hurried examination the patient was followed by prescription of a rtnight's medicine, a state of affairs which reflected great credit on either the hospitals or the profession. n object of this meeting was to help the B.M.A. end this state of affairs and replace it by something tter. Members of hospital staffs had been invited attend, so that all sides could be discussed. The nclusions and recommendations of the Council ere as follows:—

1. That a large amount of the work at present undertaken the out-patient departments of voluntary hospitals is necessary and can be reduced.

2. That the volume of work at present undertaken at e out-patient departments is such that the best use cannot made of the services of the members of the hospital affs.

3. That there is considerable wastage of public money and professional time and skill.

4. That the existing internal and external checks at esent employed are not sufficiently stringent.

5. That further checks and safeguards should be tablished at all voluntary hospitals before treatment is dertaken at the out-patient department.

6. That the primary object of the out-patient department should be for consultation.

7. That while there should be adequate opportunities r consultation purposes between the private practitioner d members of the visiting medical staffs at out-tients departments, practitioners should not countenance e use of that department by their patients, except in the ays laid down in this memorandum.

8. That the casualty department should be available in y emergency.

9. That only such treatment should be given at the partment as cannot in the best interests of the patient obtained elsewhere under the usual arrangements as tween private practitioner and private patient, or under ntract arrangements.

10. That cases admitted for treatment at out-patient partments should be reviewed at regular intervals by the edical staffs.

11. That no person, except in cases of emergency, should accepted for treatment as an out-patient at a voluntary ospital unless he brings a recommendation from a private edical practitioner, a provident or other dispensary, a ublic clinic, or from a public assistance medical officer of local authority.

12. Where out-patient departments are shown to be ecessary in connexion with council hospitals, the rinciples applicable to voluntary hospitals, as set out in he preceding paragraphs, should apply.

THE HOSPITAL'S ATTITUDE.

Major R. R. GARRATT (Secretary, Royal Free ospital) said this subject had been before the uthorities of his hospital for a long time. The ospital tried to be of the greatest possible usefulness to the public, and it had appointed a subcommittee to ascertain how this and other problems connected with the out-patient department could best be served. The demand for hospital treatment and care came from the patient himself, and that being so, the hospital authorities were unable to keep him away. Patients felt that at hospital they could be sure of having a more thorough examination than at the hands of the general practitioner. Therefore the matter rested a great deal with the members of the profession. To obtain hospital advice and treatment, patients seemed quite willing to wait a considerable time. No hospital wished to have its out-patient department overcrowded with chronic cases. In every well-organised hospital every effort was made to refer patients back to their own general practitioner, but patients could not be forced to go back to him. Also, patients were encouraged to bring a letter from their doctor, for he agreed that the prime function of the out-patient department should be consultative. Usually it was found that the panel doctor was not one who was ready to give a patient a letter to take to a particular hospital. At the teaching hospitals there must be adequate clinical material, and the quality of the material was not known until an examination had been made. If there could be devised a simple system of reference back to the practitioner from the hospital, the Royal Free Hospital would support it.

The LADY ALMONER of the Royal Free Hospital said that consideration for the patients must come first, and for their comfort the numbers must be reduced. It was now more important than ever that the hospitals should be consultative centres. About half the panel patients who came to hospital did not bring letters.

Miss ELIZABETH BOLTON said that to many very poor patients a levy was a great hardship.

Dr. H. S. BURNELL-JONES thought no out-patient should be seen unless he presented a letter from his doctor. The sympathetic coöperation of hospital staffs was necessary for dealing with this question.

Mr. JENNER VERRALL spoke on the special department aspect. It was the exception, he said, for a patient to reach his department at the Royal Free Hospital without presenting a letter from his doctor, and he believed that was true also of the other special departments of the hospital. He never inquired whether a patient was a panel patient. He made a big effort to personally answer all the letters brought by patients; but it was difficult, and there was a great need of clerical assistance. He expressed a strong objection to the suggestion behind recommendation No. 10 that cases should be reviewed at regular intervals by the medical staffs. Surely that was the practice at every hospital?

Mr. J. WIGG contended that some 80 per cent. of the population were provided in some way with medical service, and the solution of the present out-patient difficulty lay largely in the hands of the practitioners in the district. A member of his staff had suggested that blocks of forms should be used, perforated down the centre, one side containing particulars of the patient to be sent with him to the out-patient department, and the other retained by the practitioner.

TOO MANY OUT-PATIENTS.

Dr. PEARSON said that nowadays patients got the best available service; the question was whether it was very costly, or whether people should be allowed to attend out-patient departments as much as they did. Certainly the out-patient department should be used more for consultative purposes;

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[1] See Brit. Med. Jour. Supplement, Fe[illegible] 21st.

[illegible] Library

but if the attendances were cut down very much, the educative value of the institution would be largely destroyed. The only real solution that he could see was to insist that each patient should bring a doctor's letter.

Dr. TURNER spoke of the large demands made on hospitals by members of the Hospital Saving Association. They paid 3*d*. a week against the possibility of needing hospital treatment, and mostly seemed bent upon getting their money's worth.

Dr. OWEN THEOBALDS said that many people were now drifting into hospitals who formerly would not have thought of doing so, and in many cases—he gave examples—they were receiving free what they could well afford to pay for in private consultation.

Mr. A. C. ADAMS (Secretary, National Temperance Hospital) spoke of the valuable work done by almoners in checking the abuse of hospitals. At his hospital every effort was made to eliminate nonessential cases as much as possible. The Hospital Saving Association and other kindred bodies rendered a solution of this subject more difficult than it would otherwise have been.

Dr. P. P. DALTON warmly resented the veiled attacks which had been made on panel practitioners; it had been said that when patients brought up Hospital Saturday Fund letters they were carefully scrutinised, and panel patients were returned to their doctors. Yet the panel doctor was the personal family doctor; he was not a separate entity. In London at the present time public charity was being grossly abused. In all directions money was being collected for charitable purposes—i.e., for the destitute poor—and was being largely spent on those who could not only afford private fees, but were sometimes better off than those who subscribed. The general practitioner was being stamped out of existence, and when the process was complete, who would be at the call of the family for medical attendance, for confinements, &c.? Hospitals would not take on that work. As much money was being subscribed for hospitals as before the war. The grants to hospitals from the King's Fund were not according to the number of cases they cured, nor according to the number of cases passing through their beds, but according to the number of out-patient attendances they scored; so that if a hospital had its out-patients coming twice as often, or had twice as many out-patients, it would receive an increased grant. Practitioners could not help regarding themselves as competitors with the hospitals, and he urged coöperation with hospital staffs as a solution of the difficulty.

THE PATIENT'S RIGHTS.

Dr. GEOFFREY EVANS said the B.M.A. thought of the doctors first, and it made a fundamental mistake in its policy in not thinking of the public first. If it did it would strengthen its position. Patients must be allowed their freedom. He disagreed with the idea that patients should not be seen at hospital unless they came armed with a letter from their doctor. But he wrote a letter about every patient he saw. Dr. J. H. Drysdale gave him this advice: "You sit in your room and see people who ask your advice; you use your discretion as to whether you give your opinion; and you can say to the patient 'before I give my opinion I will talk your case over with your doctor.'" Doctors worked for people who appreciated their work. If the B.M.A. tried to tie people to their doctors and they succeeded in it, they would collapse. Recommendation No. 11 he regarded as a scandal; it was ethically wrong. When he saw patients he did not inquire about their income, he only wanted to know what their complaint was, and, having ascertained that, he did his best for them. He disliked the statements about doctors being in competition with hospitals. It was not the first object of teaching hospitals to be consulting centres; that was the second object. Their first object was the teaching of the profession and the study of medicine.

CANCER OF THE LIP, TONGUE, AND SKIN.

A MEMORANDUM FROM THE MINISTRY OF HEALTH

THE eighth of a series of memoranda on cancer being issued from the Ministry of Health for the guidance of local authorities has just appeared. This memorandum relates to cancer of the lip, tongue, and skin, and is based largely upon an examination, including a statistical analysis of such matters as lend themselves to the process, of available published writings on cancer of these organs.[2] Malignant growths in these three organs have in common a character which may facilitate their early recognition or even preventive treatment. This character is the persistence prior to the development of the cancer of an apparently harmless or at least noncancerous condition. Advantage can be taken of this warning only if suitable instruction and advice is provided for the community.

This group of cancers provides opportunities for the application of preventive medicine, in the modern sense, in three aspects: (1) Prevention or removal of conditions associated with causation. (2) Curative treatment of abnormal conditions likely to develop the cancerous change. (3) Surgical removal, by operation, radiation, &c., of the actual cancer at an early stage.

Some of the preventive measures available concern the education of the community to the realisation that certain habits, such as smoking or chewing tobacco, or picking or scratching warts or moles may set up "chronic irritation" of some parts of the body, notably the skin or the orifices, and that any chronically irritated area which after a time shows a marked change should be submitted to medical examination and treatment without delay.

Avoidance of syphilitic infection, attention to oral hygiene, elimination of environmental factors which may adversely affect the health of industrial workers are also mentioned.

Special measures are advised in relation to substances used in industry, such as certain oils and tar, tar derivatives, arsenic and soot which may contain carcinogenic agents, and to workers who come into contact with them.

It is noted that the avoidance of unnecessary exposure to X rays and the adoption of suitable precautions has resulted in new cases of the preceding inflammatory condition of the skin becoming very rare, and it is anticipated that this variety of the disease will in due course be eliminated.

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[1] Circular 1186. H.M. Stationery Office.

[2] See Reports on Public Health and Medical Subjects No. 59. H.M. Stationery Office. May, 1930.

BRITISH ORTHOPÆDIC ASSOCIATION.—The Robert Jones medal and association prize of this association has been awarded for 1930 to Mr. Harold Clifford Edwards for an essay on Injuries of the Tendons and Muscles.

OBITUARY

ENRY PERCY DEAN, M.S. Lond., F.R.C.S. Eng.,

CONSULTING SURGEON TO THE LONDON HOSPITAL.

We regret to record the death of Mr. Percy Dean ich occurred at his house in Abinger-road, Bedford rk, on April 14th in his sixty-seventh year.

Henry Percy Dean was born in London and educated University College, London, and at the medical hool at University College Hospital. He disiguished himself as a student, being scholar and edallist in the University in physiology, holding e of the surgical exhibitions, and obtaining the gold edal in anatomy. He graduated as B.Sc. in 1884 d as M.B., B.S. four years later, while he took the .S. Lond. in 1889 and the F.R.C.S. Eng. in the me year. Having held the usual residential posts became assistant surgeon at the London Hospital 1892 and obtained charge of beds as full surgeon 1899. As hospital officer and as teacher of operative rgery at "The London" he made a distinct mark, hile he also had a well-deserved reputation as a ediatrist, due to his long connexion with the ueen's Hospital for Children. For a considerable riod he was also a surgeon to the Royal Northern ospital.

Dean was a clear and well-informed writer, and his ntributions to medical literature, though neither any nor long, were definitely valuable. In his rlier writings his physiological equipment was vious. On the innervation of the pulmonary ssels he contributed a paper to the Proceedings of e Royal Society in 1889, and he wrote on the same bject in the *Journal of Physiology* a few years later. the Proceedings of the Neurological Society he ade an interesting contribution upon the temperare of the two sides of the body in cerebral comession, a paper which was followed by one published the *Journal of Pathology* on Cerebro-spinal Pressure. The Lancet he communicated an account of a ccessful operation for cerebellar abscess. He was so author of the articles on injuries and diseases of e head in Treves's "System of Surgery," and he lited Heath's "Injuries and Diseases of the Jaw."

Dean was still under 50 when he retired from spital practice, being made consulting surgeon the London Hospital in 1913, a position which he so occupied at the Queen's Hospital for Children. e was a Fellow of University College, London.

HE LATE MAJ.-GEN. G. F. A. HARRIS, I.M.S.

An old colleague and friend writes: "I would be ad of your permission to supplement the account the official career of General Harris in The Lancet April 25th, by a reference to his personal qualities. istinguished alike in his profession and in the rvice to which he was devoted, he earned the nfidence and esteem of all who had the good fortune serve with him or under him. After his retirement ward he continued to take an active interest in edical and service questions. During the late war e returned to duty and worked on an Army medical oard and as an inspector of V.A.D. hospitals. There re few whose loss will be more generally deplored y brother officers and friends."

Tyrrell Cottage Hospital, Ilfracombe.—An ray department has just been opened at this institution at cost of £650.

MEDICAL NEWS

University of Cambridge.

On April 24th the following degrees were conferred:—

M.D.—H. V. Coverdale (*by proxy*), and G. K. Kirwan-Taylor.

M.B. & B.Chir.—M. A. Robertson, W. V. Howells, J. J. Keevil, I. B. Morris, and J. A. Pocock.

M.B.—Gwyn Rocyn-Jones.

B.Chir.—G. K. Kirwan-Taylor.

At recent examinations the following candidates were successful:—

DIPLOMA IN MEDICAL RADIOLOGY AND ELECTROLOGY.

Part I.—Gilbert Maclean, and W. S. C. Yuen.

Part II.—P. C. Basu, Samuel Bradbury, Isabella M. G. Butler, T. V. L. Crichlow, James Grieve, K. H. Hallam, Elfrida L. G. Hilton, C. C. Kapila, Ethel E A. Pepper, H. W. A. Post, Raseela Rekhi, F. P. Schofield, and I. C. C. Tchaperoff (*Cai*).

Royal College of Surgeons of England.

Six Hunterian lectures on Human Monsters and Malformations, illustrated by specimens from the museum, will be given by Sir Arthur Keith on Mondays, Wednesdays, and Fridays from May 4th at 5 P.M. (except on May 15th, when the time will be 4 P.M.).—In two lectures on experimental research at the Pasteur Institute, Coonoor, South India, Colonel Robert McCarrison, I.M.S., will describe diseases induced in animals by faulty nutrition and discuss the causation of urinary calculus in man and in cattle in India. These lectures will be given at 5 P.M. on May 18th and 20th.

West-End Hospital for Nervous Diseases.

Speaking at the annual meeting last week, Sir Leonard Brassey said that this hospital has for many years had the largest neurological out-patient department in the country. The report states that of all types of hospital there is none more literally national in its sphere, patients having been received last year from 33 out of 52 counties, as well as from overseas. The expenditure exceeded the income by £1771.

Bayliss-Starling Memorial Scholarship.

This scholarship, founded in memory of Sir William Bayliss and Prof. E. H. Starling, is tenable at University College, London, and is of the annual value of about £120, with exemption from tuition fees. The scholar will be required to follow a course of study approved by the Jodrell professor of physiology, involving a training in the principles of, and methods of research in, physiology and biochemistry. Candidates must apply to the secretary of the College not later than May 15th.

Society of Apothecaries.

A Livery dinner was held in the Hall of the Society of Apothecaries on Tuesday, April 28th, when Col. C. T. Samman, the Master, presided, supported by the Wardens, Col. E. C. Freeman and Dr. Cecil Wall. Mr. Arthur Greenwood, Minister of Health, was the principal guest.

After the loyal toasts Sir Stanley Hewett, Surgeon Apothecary to the King, was awarded the honorary diploma of the Society, and in presenting the new licentiate to the Master, Sir William Willcox made an interesting résumé of the history of the Society which extends now over 300 years, and referred to the fact that throughout that long expanse of time only two honorary diplomas had been granted by the Society, the holders being the present Prince of Wales and Sir John Lynn-Thomas.

The toast of the Civil Service was proposed by Mr. Greenwood, who took occasion to point out to the audience how deep was the debt owed by the public to the faithful servants of the State, whose duty it was to remain constant in their ideals of service while through political necessity being under the rule of successive different Ministers. In the course of his speech he made special reference to the difficult position in which public servants are placed when personally attacked in the papers because they have no right to reply. Here he was speaking not only of private complaints but of the utterances of politicians holding office and other public representative men who used the medium of the newspapers to attack a body who are unable to reply from the nature of their offices. He claimed for the British Civil Service a high position as a body of men who were capable, reliable, and honourable, and who spent their lives in the public weal. The toast was replied to by Sr. Arthur Robinson, the Secretary to the Ministry of Health.

The toast of the guests was proposed by Sir George Makins, and Sir John Bland-Sutton, Lord Ebbisham, and Mr. Whiteley, K.C., replied.

Royal Berkshire Hospital.

An appeal is being made for £30,000 to liquidate the debt on the Blagraves branch hospital, and it is calculated that a contribution of two shillings per head from the population of the county would provide this money. An amount has therefore been apportioned to each parish, solely on a population basis, and each unit is being asked to aim at this "target."

Perth Mental Hospital.

James Murray's Royal Mental Hospital, Perth, has just been extended by the erection of the Gilgal Hospital for the treatment of patients suffering from mild nervous and mental breakdowns. The wards, each of which has its private veranda and garden, provide for 40 patients. The hospital contains a certain quantity of antique furniture, and most of the rest has been made locally to the design of Dr. W. D. Chambers, the physician-superintendent.

Extension of Dunfermline Hospital.

Last week Sir Ralph Anstruther, Lord Lieutenant of Fifeshire, opened the completed extensions to the Dunfermline and West Fife Hospital. The old part of the hospital has been completely renovated and re-equipped, and a large out-patient department added, at a cost of £10,000. The nurses' home at Priory House has also been enlarged and improved

The Booking of Out-patients.

The experiment of booking appointments for out-patients at the Manchester Jewish Hospital is reported to be a complete success. It is found that the doctors are never "held up" since any patient not in time loses his turn, and it is calculated that the patients' time is being saved at the rate of 200,000 hours a year. Inquiries as to the working of the scheme are being received from all parts of the world.

Excess of Out-patients.

Last year the patients admitted to the Norfolk and Norwich Hospital numbered 5973, an increase of 283 over the preceding year, and the largest on record. Their average stay was 19·4 days. The number of new out-patients—18,025—was fractionally smaller than in 1929. Attendances, however, increased from 87,572 to 93,029. The board of the hospital point out that the continued increase in the work of the out-patient department "is neither necessary nor desirable, as many of the patients now sent to the hospital could be effectively treated by their own medical attendants."

Memorial to William Smellie.

Last Saturday Prof. Munro Kerr unveiled the renovated memorial stone to Dr. William Smellie in St. Kentigern's Old Churchyard, Lanark. Dr. Haig Ferguson, President of the Royal College of Surgeons of Edinburgh, recalled that Smellie, who had been described as the greatest of British accoucheurs, died in 1763. Two years ago the Edinburgh and Glasgow Obstetrical Societies visited Lanark and agreed that it would be a fitting thing to renovate the tombstone as a tribute to the great man whose memory they desired to signalise and perpetuate. Prof. Munro Kerr related that Smellie was born in Lanark, was admitted a member of the Faculty of Physicians and Surgeons in Glasgow in 1733, and received the M.D. of Glasgow University in 1745. He had practised for 19 years in Lanark and then gone to London. Smellie was what would now be termed a great obstetric surgeon, and his case-records and writings could still be read with great interest and profit.

Rockefeller Medical Fellowships.

The Rockefeller Medical Fellowships for the academic year 1931–32 will shortly be awarded by the Medical Research Council, and applications should be lodged with *the Council not later than June 1st.* The Fellowships are provided from a fund with which the Council have been entrusted by the Foundation. Fellowships are awarded to graduates who have had some training in research work, in the primary sciences of medicine or in clinical medicine or surgery, and are likely to profit by a period of work at a university or other chosen centre in the United States before taking up positions for higher teaching or research in the British Isles. In special circumstances the Fellowships may be tenable at centres of research not in America. A Fellowship held in America will have the value of not less than £350 a year for a single Fellow, with extra allowance for a married Fellow, payable monthly in advance. Travelling expenses and some other allowances will be paid in addition. Full particulars and forms of application are obtainable from the Secretary, Medical Research Council, 38, Old Queen-street, London, S.W.1.

Collections at Glasgow.

The Glasgow university students collected the sum no less than £15,070 for local charities on Jan. 17th of year, and this was allocated last week by the stud representative council executive. The recipients of the largest amounts were the Royal, Western and Vict *Infirmaries, which each received over £2000;* the Roy Maternity Hospital and Royal Hospital for Sick Chil both received slightly less.

A Florentine Hospital.

The Ospedale di Camerator on one of the slopes of the Fiesole hills, which has developed from the A Hospital for Italian Wounded erected during the wa was opened recently. After the war the original hosp became a free dispensary for the scattered population the Fiesole district, and later on a nursing home of ten was added. The new fully equipped hospital has men's women's, and children's wards and a few private wards f paying patients with a total of 50 beds. It has hi been difficult in Florence to obtain accommodation for and travelling foreigners with nurses speaking their ow language.

Medical Diary

Information to be included in this column should reach in proper form on Tuesday, and cannot appear if it reach us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
TUESDAY, May 5th.—5.30 P.M., ORTHOPÆDICS. (Cases a 4.30 P.M.). Electin of Officers and Council.
WEDNESDAY.—5 P.M., HISTORY OF MEDICINE. Elect of Officers and Council. Dr. George C. Peache Thomas Trapham, Cromwell's Surgeon, and Oth 8.30 P.M., SURGERY. Election of Officers and Coun Discussion: The Surgical Treatment of Simple Ulc of the Body of the Stomach. Openers: Mr. A. J. Walton, Mr. G. Gordon-Taylor. Followed by Mr. Cecil Joll and others.
THURSDAY.—8 P.M., TROPICAL DISEASES AND PARASITOLOG Election of Officers and Council. Discussion: Th Treatment of Amœbic Dysentery. Opene Dr. P. Manson-Bahr. Other speakers will take pa
FRIDAY.—5.30 P.M., CLINICAL. (Cases at 4.30 P.M.) Electi of Officers and Council. Mr. Cecil P. G. Wakeley 1. Compound Comminuted Depressed Fracture of th Skull Five Years after Operation. 2. Intra-uteri Amputation of Left Leg in a Child. Dr. F. E. Saxby Willis: 3. Chronic Anæmia with Multiple Telangiec tases. Other cases will be shown.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.
MONDAY, May 4th, and following WEDNESDAY and FRIDAY.—5 P.M., Sir Arthur Keith: Human Monsters & Malformations—illustrated by specimens.
ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.
TUESDAY, May 5th.—5 P.M., Prof. Samson Wright: Certa Aspects of the Reflex Control of the Nervous Syste First Oliver Sharpey Lecture.
THURSDAY.—5 P.M., Second Oliver Sharpey Lecture.
FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, May 4th, to SATURDAY, May 9th.—MEDICA SOCIETY OF LONDON, 11, Chandos-street, Cavendish square, W. M.R.C.P. SPECIAL COURSE. Tues., Dr. Roodhouse Gloyne: The Histology of the Tubercul Lesion. Fri., Dr. Donald Hunter: Bone Growth & Metabolism. Medical Aspects of Diseases of Bone 8.30 P.M.,—CENTRAL LONDON THROAT, NOSE, AN EAR HOSPITAL, Gray's Inn-road, W.C. Intensi Clinical Course.—INFANTS HOSPITAL, Vincent-squar S.W. Afternoon course. Second week.—MAUDSL HOSPITAL, Denmark-hill, S.E. Course in Psycholog Medicine.—ST. JOHN'S HOSPITAL, Leicester-squa W.C. Afternoon and evening course. Lectures on the days in the week.—Further particulars from the Fellowship of Medicine.
SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, Balham, S.W.
WEDNESDAY, May 6th.—4 P.M., Mr. V. Z. Cope: Demonstra tion of Surgical Cases.
LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
MONDAY, May 4th.—5 P.M., Dr. S. E. Dore: Anim Parasites.
TUESDAY.—5 P.M., Dr. H. W. Barber: Alopecia Area and Vitiligo.
THURSDAY.—5 P.M., Dr. A. C. Roxburgh: Differenti Diagnosis of some Common Skin Diseases.
FRIDAY.—5 P.M., Dr. G. B. Dowling: Skin Diseases due Protein Sensitisation.

OYAL NORTHERN HOSPITAL, Holloway-road, N.

MONDAY, May 4th.—2.15 P.M., Mr. L. E. Barrington-Ward: Demonstration of Surgical Cases. 3.15 P.M., Mr. C. S. Lane-Roberts: Some Recent Advances in Obstetrics.

TUESDAY.—2.15 P.M., Mr. F. D. Saner: Selected Cases. 3.15 P.M., Dr. E. G. B. Calvert: Common Disorders of the Colon.

WEDNESDAY.—2.15 P.M., Dr. Bernard E. Schlesinger: Some Problems in Infant Feeding. 3.15 P.M., Dr. H. C. Semon: Demonstration of Cases.

THURSDAY.—2.15 P.M., Mr. G. G. Penman: Affections of the Lids. 3.15 P.M., Dr. Bruce Williamson: The Heart in General Practice.

FRIDAY.—2.15 P.M., Mr. A. M. Zamora: Demonstration and Discussion of Cases. 3.15 P.M., Dr. C. Gouldesbrough: Recent Experiences in the Treatment of Cancer by the "Activated Fluorescein" Method.

AMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.

WEDNESDAY, May 6th.—4 P.M., Mr. A. Sorsby: Headaches.

ING'S COLLEGE, Strand, W.C.

THURSDAY, May 7th, and following FRIDAY.—5.30 P.M., Prof. W. J. Dilling: The Pharmacology and Therapeutics of Lead Colloids.

NIVERSITY COLLEGE, Gower-street, W.C.

THURSDAY, May 7th.—5 P.M., Dr. R. J. Lythgoe: Special Sense Physiology. (First of six lectures.)

ESTMINSTER HOSPITAL MEDICAL SCHOOL, 12, Caxton-street, S.W.

MONDAY, May 4th, and following TUESDAY.—5.30 P.M., Dr. Max Cheval: Treatment of Malignant Tumours by Radium Placed at a Distance.

ONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE, Keppel-street, Gower-street, W.C.

MONDAY, May 4th.—5 P.M., Sir George Newman: The Rise of Preventive Medicine. (Heath Clark Lecture.)

TUESDAY.—2 P.M., Dr. O. F. White: Port Work. 5 P.M., Sir G. Newman: Second Heath Clark Lecture.

WEDNESDAY, THURSDAY, and FRIDAY.—5 P.M., Third, Fourth, and Fifth Heath Clark Lectures.

FRIDAY.—2 P.M., Dr. J. J. Buchan: Industrial Hygiene. The Rôle of the M.O.H.

NIVERSITY OF BIRMINGHAM.

TUESDAY, May 5th.—3.30 P.M. (at the General Hospital), Dr. Stanley Barnes: Demonstration of Cases of Nervous Disease.

WEDNESDAY.—4 P.M. (in the Large Theatre of the Medical Faculty Buildings, Edmund-street.) Sir Hubert Bond: Some Correlations between General and Psychological Medicine. (First of five William Withering Memorial Lectures.)

FRIDAY (at the Queen's Hospital).—3.30 P.M., Mr. Bernard Ward: Cases Illustrating Problems of the Genito-Urinary Surgery.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, May 5th.—4.15 P.M., Mr. J. Morley: The Indications for Local and Spinal Anæsthesia.

FRIDAY.—4.15 P.M., Dr. W. Dyson: Demonstration of Dermatological Cases.

MANCHESTER VICTORIA MEMORIAL JEWISH HOSPITAL, Elizabeth-street, Manchester.

WEDNESDAY, May 6th.—4.10 P.M., Mr. V. F. Lambert: The Surgical Treatment of Asthma.

Appointments

HUME, J. BASIL, M.S. LOND., F.R.C.S. Eng., has been appointed Assistant Surgeon to St. Bartholomew's Hospital.

WILKINSON, K. D., M.D., Ch.B. Birm., Consulting Physician to the Nuneaton General Hospital.

Certifying Surgeons under the Factory and Workshop Acts: FRANKS, J., L.R.C.P. Lond., M.R.C.S. Eng. (Winchester); FOURACRE, S. F., M.B., B.S. Lond. (Withernsea, Yorks); MAXWELL, L. B., M.B., Ch.B. Camb. (Sutton, Surrey); MACPHAIL, A., M.B., Ch.B. Aberd. (Stornoway, Ross); OWEN, L. E., L.R.C.P. Lond., M.R.C.S., Clynderwen, Pembroke).

Vacancies

For further information refer to the advertisement columns.

Ashton-under-Lyne District Infirmary.—H.S. At rate of £150.

Barrow-in-Furness, County Borough.—Asst. M.O. £500.

Belgrave Hospital for Children, 1, Clapham-road, S.W.—H.S. At rate of £100.

Birkenhead General Hospital.—H.P. £100.

Birmingham City Babies Hospital, Maternity and Child Welfare Dept.—Jun. Res. M.O. At rate of £100.

Birmingham, Dudley-road, Hospital.—Jun. Asst. M.O.'s. Each at rate of £200.

Birmingham General Hospital.—Two Res. Anæsthetists. Each £120. Also Two Res. H.S.'s. Each £70.

Birmingham Queen's Hospital.—Cas. H.S. £70. Also H.P. for Midland Nerve Hospital. £70.

Birmingham University.—Tutor in Dental Clinical Subjects. £800.

Birmingham University, Faculty of Medicine.—Chair of Anatomy. £1100.

Bradford Royal Infirmary. H.P. and H.S. Each £150.

Brentwood, Essex County Mental Hosp.—Jun. Asst. M.O. £510.

Burnley, Victoria Hospital.—H.P. At rate of £150.

Cancer Hospital, Fulham-road, S.W.—Director of Research Inst.

Cardiff Royal Infirmary.—H.S. to Ophth. Dept. At rate of £75.

Chesterfield and North Derbyshire Royal Hospital.—Cas. O. At rate of £200.

Cheyne Hospital for Children, Cheyne-walk, Chelsea, S.W.—Hon. Surgeon for Diseases of the Throat, Nose, and Ear.

Constance-road Institution, East Dulwich, S.E.—Asst. M.O. £350.

Croydon County Borough, Mayday-road Hospital—Res. Asst. M.O. £300.

Croydon, Mayday-road Hospital.—Res. Asst. M.O. £300.

East Ham County Borough.—Asst. M.O. £500.

East London Hospital for Children and Dispensary for Women, Shadwell, E.—Res. Cas. O. £125.

Gloucester, Gloucestershire Royal Infirmary.—2nd H.S. £120.

Great Yarmouth General Hospital.—H.S. £140.

Hackney Hospital, High-street, Homerton, E.—Temp. Asst M.O. At rate of £250.

Hellingly, East Sussex County Mental Hospital.—Two Jun. Asst. Res. M.O.'s. Each £350.

Hong-Kong University, Faculty of Medicine.—Professor of Pathology. £1000.

Hospital for Epilepsy and Paralysis, Maida Vale, W.—Hon. Asst. Physician. Also two Med. Regs. Each £200.

Hospital for Sick Children, Great Ormond-street, W.C.—Ophth. Surgeon.

Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W. Res. H.P. At rate of £100.

Hull Municipal Maternity Home and Infants Hospital.—Jun. Res. M.O. £100.

Hull Royal Infirmary.—H.S. to Ophthal. and Ear, Nose and Throat Depts. At rate of £150.

Ilford Borough.—Asst. M.O.H. £600.

Ilford, King George Hospital.—Two Hon. Anæsthetists. Each £50.

Kidderminster and District General Hospital.—H.S. £150.

Kingston-upon-Thames, Surrey County Mental Hospital.—Jun. Asst. M.O. £350.

Leeds General Infirmary.—H.S. to Radio Surg. Dept. At rate of £100.

Leeds Hospital for Women.—H.S. At rate of £50.

Leeds, Herzl Moser Hospital, Leopold-street.—R.M.O. £100.

Leicestershire and Rutland Mental Hospital, Nasborough, near Leicester.—Asst. M.O. £350.

Liverpool Eye and Ear Infirmary.—H.S. to Ophth. Dept. £100.

Liverpool Hahnemann Hospital, Hope-street.—Res. M.O. At rate of £100. Also Clin. Asst.

London Jewish Hospital, Stepney Green, E.—Med. Reg. £100. Surg. Reg. and Ear, Nose and Throat Reg. Each 60 guineas. Res. M.O. and Cas. O. Each at rate of £150. Also Jun. Res. M.O. At rate of £100.

London Hospital, E.—Asst. Phys. to Children's Dept.

Macclesfield General Infirmary.—2nd H.S. At rate of £150.

Manchester Ear Hospital, Grosvenor-square, All Saints.—H.S. At rate of £150.

Middlesex County Council.—District M.O. and Public Vaccinator for Parish of Harefield. £45.

Mile End Hospital, Bancroft-road, Mile End, E.—Temp. Asst. M.O. At rate of £250.

Newcastle-upon-Tyne, Hospital for Sick Children.—H.S. At rate of £100.

Newcastle-upon-Tyne, Royal Victoria Infirmary.—Hon. Surg. to Orthopædic Dept.

Norwich, Norfolk and Norwich Hospital.—Cas. O. and H.S. £120.

Oldham Royal Infirmary.—H.P. and Cas. O. Each at rate of £175.

Oxford Eye Hospital.—H.S., £150.

Plymouth, South Devon and East Cornwall Hospital.—Res. Surg. O. and H.S. At rate of £150 and £100 respectively.

Poplar Hospital for Accidents, East India Dock-road, E.—Sen. Res. O. £200.

Radium Institute, Riding House-street, W.—H.S. At rate of £150.

Rochester, St. Bartholomew's Hospital.—Res. Surg. O. At rate of £225.

Rotherham Hospital.—H.P. £180. Cas. H.S. £150.

Royal Chest Hospital, City-road, E.C.—Res. M.O. Also H.P. at rate of £150 and £100 respectively.

Royal Free Hospital, Gray's Inn-road, W.C.—Asst. M.O. for V.D. Dept. £350. Also Sen. Clin. Asst. for Infant Welfare Dept.

Royal Northern Hospital, Holloway, N.—H.S. At rate of £70.

St. Alfege's Hospital, 48, Vanburgh-hill, Greenwich, S.E.—Temp. Asst. M.O. At rate of £250.

St. Andrew's Hospital, Bow, E.—Temp. Asst. M.O. At rate of £250.

St. Bartholomew's Hospital, E.C.—Asst. Physician-Accoucheur.

St. Giles' Hospital, Brunswick-square, S.E.—Temp. Asst. M.O. At rate of £250.

St. James's Hospital, Ouseley-road, Balham, S.W.—Temp. Asst. M.O. At rate of £250.

St. Mary Abbott's Hospital, Marloes-road, Kensington, W.—Asst. M.O. £350.

St. Mary's Hospital for Women and Children, Plaistow, E.—Res. M.O. At rate of £175.

Sheffield Royal Infirmary.—Vacancy in Hon. Surgical Staff.

Stalybridge Borough.—M.O.H. £850.

Swansea General and Eye Hospital.—Cas. O. £200.

Taunton, Taunton and Somerset Hospital.—H.P. £100.

University College, W.C.—Bayliss-Starling Memorial Scholarships. £120.

Walsall Manor Hospital.—Jun. Res. Asst. M.O. £150.

West Bromwich, Hallam Hospital.—Res. H.S. £250.

Wigan Infirmary.—H.S. At rate of £150.

Worksop, Victoria Hospital.—H.S. At rate of £170.

Wrexham and East Denbighshire War Memorial Hospital.—Two Res. H.S.'s. Each at rate of £150.

York County Hospital.—H.S. £150.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Dalston (Cumberland).

NOTES, COMMENTS, AND ABSTRACTS

4

MAINTENANCE OF TUBERCLE-FREE HERDS OF MILCH COWS.

TWENTY-FIVE years' experience in Birmingham has shown[1] something of the difficulties experienced in the maintenance of tubercle-free herds. Breeders everywhere will be grateful to the Hannah Dairy Research Institute for its bulletin on this subject just issued.[2]

In the autumn of 1923 there were 16 producers of Certified or Grade A (T.T.) milk in Scotland, and in 1928 their number had increased to over 90. Information was supplied to the investigators by the owners of 96 herds, comprising, at the spring test of 1929, 3913 cows, of which 53, or 1·35 per cent., reacted. During the whole inquiry 28,221 official tests were recorded, of which 428 were positive. This represents an average annual loss of three reactors per 100 head of milking stock. Ideally, after the initial clearing of the herd, the subsequent percentage of reactors should be reduced to nil. In practice only 18 out of the 96 herds investigated attained this ideal. Among these 18, there were six herds comprising respectively 76, 28, 103, 30, 40, and 27 animals, which have had no reactor for six years.

CAUSE OF FAILURE.

With the help of the owners and the county veterinary officers, investigation was made into the probable cause of failure in the case of 462 reactors. and the conclusion reached that failure was due in 34 per cent. to infected stock purchased, which was supposed to be tubercle-free; in 24·5 per cent. to contact with other reactors or untested stock; in 11·5 per cent. to infection from contaminated premises and pastures; in 19 per cent. to miscellaneous and multiple sources of infection; in 4·5 per cent. to anomalous tuberculin tests; and in 6 per cent. they were unable to trace the source of infection.

HOW TO ENSURE SUCCESS.

In order to eliminate the main sources of infection in tuberculin-tested herds it is recommended that during the initial stage of clearing the herd a three-monthly test be adopted in order to limit the period of contact between tubercle-free animals and infected stock. The authors strongly advise the adoption of a uniform technique and the use of a standardised tuberculin, and suggest the double intradermal test as being of outstanding merit. All doubtful cases, they say, should be classed as reactors. They strongly urge that the herd should be maintained by breeding only, tubercle-free bulls being used for service. When occasional purchases have to be made they should not be made in the open market, and the veterinary surgeon, who gives the clean certificate, should also supply the history of the animal and of the conditions on the farm from which it is purchased, and whether there has been any opportunity for contact with non-tested animals. Precautions should also be taken for the transit of the new purchase, which should be isolated after its arrival until two confirmatory official tests have been made three months and six months respectively after arrival. The authors also make the suggestion that an agency for facilitating safe purchases might be undertaken by the Scottish Certified and Grade A (T.T.) Milk Producers Association.

PRECAUTIONS ON THE FARM.

To prevent the spread of infection on the farm it is the following precautions are suggested: (1) Drastic disinfection after reactors have been discovered, and the temporary isolation of cows in adjoining stalls. (2) Protection of the tubercle-free herd from pastures liable to be contaminated with infected manure. (3) Double fencing from fields in which untested stock are likely to graze. (4) If cattle are exhibited at shows they must be protected during transit and have separate accommodation at the show from that occupied by untested stock.

If all these recommendations had been carried out, it is estimated that 90 per cent. of the 462 reactors in the present inquiry would not have contracted infection. Even as it is, the occurrence of 3 per cent. of reactors is a source of irritating expense to the owners rather than of danger to the consumer, for it is hardly possible for a reactor to have reached the dangerous stage in the period between two six-monthly tests. The latter point is specially emphasised in the preface to the Bulletin by Dr. T. Drummond Shiels, M.P., chairman of the Research Grants Committee of the Empire Marketing Board, and receives confirmation from the fact that during 1927 and 1928, when the Glasgow hospitals were supplied with milk from tuberculin-tested herds, of 550 samples examined not one sample was found to be infected.

POINTS TO BE CLEARED UP.

There are some points as to which further research is needed. In the very early stages of infection there is a pre-sensitive period during which the tuberculin test is inadequate to diagnose infection. This period may last for eight weeks or more, and explains a few cases where a purchased animal, certified as a non-reactor, may react at the subsequent test. There are also cases in which an animal reacts to tuberculin at an early test, subsequently passes similar tests for years, and ultimately breaks down perhaps under a severe strain such as difficult calving. This temporary loss of reactivity is explained by the incapsulation of an old lesion. It is therefore important to exclude all animals, which have ever reacted, from tubercle-free herds. If a general scheme for eradication were adopted, it would be necessary and quite reasonable to enforce the branding of all reactors.

The Hannah Research Institute has published a very valuable survey of existing knowledge on this subject. Perhaps the principal change since the last decade of the nineteenth century is the recognition that a short exposure is all that may be necessary for the passage of infection from one animal to another. For example, Nocard in 1893 (Les tuberculoses animales) wrote that transmission only takes place as the result of an intimate and prolonged cohabitation, and that the sojourn in a common pasture may be looked upon as free from danger. The bulletin makes no reference to the possibility of infection from tuberculous pigs or poultry.

EDUCATION AND ENTERTAINMENT FOR THE BLIND.

THE advantage of being able to read Braille is obvious to anyone who has imagined the state of blindness and its hardships. Instruction in this accomplishment is, of course, a fundamental part of work for the welfare of the blind and in cities it is a need which is met with fair success. In country districts, however, there may be only one instructor with a hundred or more charges in widely separat places. Often his visits are at intervals of over a month and between whiles the blind people easily forget their lessons and make little progress unless a relative or neighbour can give them frequent assist ance. This is not always easy, for the ordinary embossed lettering of Braille is by no means readily understood by would-be helpers, while reference to alphabetical lists and code books may make big demands on time and patience. With this in mind Dr. F. W. Alexander has set himself to construct key-boards which will simplify the task of the learner and also be a convenient guide to the amateur teacher. As at present constructed they consist of drawing boards on which the letters of the Braille alphabet are marked by round-headed nails. The signs of this alphabet, as is well known, are varying combinations of six points as on a domino, and on Dr. Alexander's board the sextet is always completed with small screws (nearly flush with the wood) so that the blind person can feel all six points and thus appreciate the relative positions of the Braille dots (round-headed nails). Against each Braille letter is its typewritten equivalent, for the benefit of sighted instructors, and the task of teaching is further simplified by the nail-heads being variously coloured according to whether the symbols are letters or word signs or abbreviations. These last are numerous in Braille, but a set of several boards will furnish the blind learner with all he needs, and will make it easy for anyone with sight to continue the work of an official instructor. Probably it will be found convenient to make the reference boards in other and cheaper materials, but some such "contraptions" (to use the inventor's word [1]) are likely to be of real service.

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[1] THE LANCET, 1930, ii., 707.

[2] Reactors in Tuberculin-Tested (Licensed Herds) by Alexander B. Fowler, B.Sc. (Agric.), and Norman C. Wright, M.A., Ph.D. Bulletin No. 2. Price 2s. post free from the Secretary of the Hannah Dairy Research Institute, Auchincruive, Ayr.

Having retired from the post of medical officer of health for Poplar, Dr. Alexander is now devoting his ingenuity to devising leisure occupations and games for the blind. He hopes to get amateur handicraft workers to help him in providing various kinds of puzzles, and he has shown us many samples which are well adapted to the amusement and interest of people who must rely on the sense of touch. The objective of many of them is to fit irregular flat pieces of wood or cardboard into geometrical figures, and for puzzles of this kind it is easy to supply a key consisting of similar pieces glued into position. It is surprising, however, to find how many other kinds of problem can be made to meet the requirements of the blind, and there are many games which they could play besides those already available to them. Dr. Alexander is to be congratulated on his well-directed efforts to fill a gap, and we hope he may find willing hands to carry out his plans.

MATERIALS OF BREAD-MAKING.

In this country the problem of the proper composition of bread is not now acute as it was during the late war when wheaten flour had to be eked out with other cereals. But in Italy even at the present day a shortage of wheat has necessitated its admixture, with rice in the Vercellese, with rye in the Alto Adige, with maize in some parts of Lombardy, and with potato flour in part of Calabria. History records, says Prof. V. Ducceschi,[2] that the Romans generally ate wheaten bread, but in Galen and Pliny reference is also made to barley, maize, and rye bread. This was probably due to the neglect of the cultivation of wheat and the great prevalence of inferior cereals. Towards the end of the Middle Ages, however, wheat culture resumed its importance, and this fact, together with the introduction of maize, diminished the use of other materials for bread-making, while the cultivation of the potato in 1800 also had an influence in this direction. Prof. Ducceschi gives tables showing the percentage of protein, fat, starch, cellulose, salt, and water in wheat and other cereals, including potato and chestnut flour and soya bean. He concludes that every addition, except soya and milk powder, tends to deprive bread of the nutritive properties which characterise the classical food made from wheat. Certain economic considerations also come into account, and in Italy even if rice, rye and potato added in certain proportion make a good bread, this fact does not entirely compensate for the deficiency of wheat. For example, rice which makes a good mixed bread might be exported to purchase a much larger quantity of wheat. Of the various types of mixed bread, maize-flour does not contain gluten, and is, therefore, not well suited for breadmaking as it does not leaven easily and the bread after baking has little substance and softness. It is, on the other hand, rich in fatty material and therefore predisposed to change, acquiring a disagreeable smell and taste. But the addition of maize-flour up to a proportion of 10–15 per cent. does not unfavourably influence the physiological and hygienic qualities of the product thus obtained. The admixture of potato-flour to the extent of 20 per cent. is one of the most advantageous from a technical and hygienic point of view, but from the point of view of national economy must be judged on its own merits, since it may be better for the people to eat potatoes in the usual manner than to use them as an addition to wheat flour. The admixture of rye gives a dirty colour to the bread and is not to be recommended when the proportion of this cereal exceeds 10 per cent., in any case it should not be more than 30 per cent. As regards rice, the offal produced by polishing would certainly add a certain nutritive value to bread as it is rich in proteins and vitamins; recently the admixture of 5 to 10 per cent. of rice has given satisfactory results in some parts of Italy.

Investigations by Prof. Ducceschi on feeding with wheaten bread mixed with 10 per cent. of soya have shown that it is equal to that of bread made of the best wheaten flour alone, and with 20 per cent. is only slightly inferior as regards absorption, and content in nitrogenous substances, fats, and carbohydrates, and when the soya is deprived of fat an admixture of 10 to 20 per cent. to wheat flour is utilised by the human organism to the same extent as white bread made with the best wheat flour alone. The soya bean would acquire a greater importance than it has at present if it could be profitably cultivated, as may happen in Italy and especially in her colonies.

Experiments at Milan have shown that the addition of 1 kg. of milk powder (corresponding to about 8·5 litres of fresh milk) to every quintal of flour will produce a bread more nutritious than the ordinary kind—porous, homogeneous, well leavened, of good keeping qualities, and tasteful. Since 1 kg. of milk flour costs 6 lire, the price of the bread would be increased to a negligible extent by the addition.

Prof. Ducceschi concludes his paper by remarking that when Italy is self-sustaining as regards food, which is an important factor in political safety, it will perhaps be possible to leave out of consideration the question of breadmaking with mixed flour; but meanwhile it is prudent to be prepared for any event.

HOMER'S SURGEONS.

[*To the Editor of* THE LANCET.

SIR,—I have read with great interest in THE LANCET Mr. Woods's article on the sons of Asklepios. The author does not mention Prof. O. Körner's new book on the medical knowledge in Homer (Die ärztlichen Kenntnisse in Ilias und Odysse, Munich, 1920). Speaking of Nestor's female slave Hekamede Mr. Woods declares her to be an apothecary, because she is said to know all the plants that grow on the earth, a statement which he thinks an exaggerated one. May I suggest that he makes here a confusion between Hekamede and Agamede, the widow of Mulius, whom Nestor had killed long ago in his youth so that she must have been a very old lady at the siege of Troy. Agamede is the Homeric form for Medea—hence her astounding knowledge of pharmacology.

I am, Sir, yours faithfully,

E. FULD.

Berlin, April 24th, 1931.

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[1] Dr. Alexander's account of early models will be found in the Medical Press and Circular for Dec. 10th, 1930.

[2] Arch. di Sci. Biol., 1931, xvi., 84.

SALUBRIDAD.

THE bulletin of the Mexican department of public health is appearing in a new form under the direction of the Service of Propaganda and Hygienic Education. An interesting article in the first number deals with the terribly insanitary state of the holy water in Catholic churches where worshippers repeatedly put their fingers or hands into the basins, kiss the images, and press their faces against the walls of the confessionals. Some of them are obviously suffering from the skin diseases so common in Mexico and hope to get cured by touching the images. Another article by Dr. Saucedo y Andrade, chief of the sanitary delegation in Tepic, gives an account of a skin disease called *el pinto* (probably the same word as *pintojo*, mottled) endemic in some parts of Mexico among the mestizos or half-bred population. *Pinto blanco*, the commonest form, is clearly a form of vitiligo, but the description of other forms such as *pinto color* (with excess of pigment), *escamosis* (scaly), and *plomizo* (lead coloured) suggests that several diseases are included in the one name and require careful sifting. The prevalence of rabies in Mexico is shown by a review of the successful results of inoculation on the lines suggested by Semple; only two out of 540 persons treated developed rabies and they were late in coming for treatment. The advantage of this carbolised vaccine is that it preserves its potency and is easily transportable. The remainder of the volume is taken up with official reports. Prof. Hoffmann, head of the bureau for biological investigation, reports on the rôle of the sinulidæ in the dissemination of onchocercosis. The impression gained from a study of this volume is the colossal task confronting the Mexican department of health, and the unrivalled field offered to the scientific investigator in every branch of medical inquiry.

NEW PREPARATIONS.

"WELLCOME" BRAND DIPHTHERIA PROPHYLACTIC T.A.F.—Diphtheria Prophylactic (Toxoid-Antitoxin Floccules), designed to produce active immunity, is prepared at the Wellcome Physiological Research Laboratories. When toxoid and antitoxin are mixed, floccules are formed which retain the immunising power of the toxoid. Removal of the supernatant liquid allows 99 per cent. of the nitrogenous bodies present in the broth after growth of the bacilli to be discarded, with a resultant diminution of the tendency of the preparation to cause undesirable reactions. With the low liability to cause reactions the preparation shows unusually high immunising power. It is issued in bottles of 1 c.cm. and 10 c.cm.

DISPERT PRODUCTS (Messrs. Coates and Cooper, 41, Great Tower-street, London, E.C.), acting as distributing agents for the manufactures of the Krause Medico-Gesellschaft, are introducing to the medical profession three of their preparations obtained by the Krause process of drug isolation. The samples sent include Digitalis Dispert, Pancreas Dispert, and Valerian Dispert, and each preparation can be employed in the conditions in which the name suggests that it has been found useful, the dosage being scientifically regulated by careful standardisation. The firm state that to medical men interested they will send samples of the products and a description of the Krause process.

We have also received from Messrs. Coates and Cooper a sample of IDOZAN, a preparation of iron with a good history behind it, for it was placed on the market nine or ten years ago (THE LANCET, 1922, ii., 1283) by the firm of Charles Zimmermann and Co. It is now distributed by Messrs. Coates and Cooper.

BYNO-EUGASTROL (Messrs. Allen and Hanburys, Ltd., Bethnal Green, London, E.) is a concentrated extract of hog's stomach presented in a palatable and assimilable form, the antianæmic and blood regenerative principles of the gastric tissue being provided in combination with liquid malt. The preparation is made up in 4, 10, and 20 oz. bottles, and three tablespoonfuls represent an amount of extract equivalent to 100 g. of fresh stomach tissue. This is the usually recommended daily dose, though it will vary, of course, in accordance with the response of the patient and the directions of the medical man. As happens in the liver treatment of anæmia, the course may have to be indefinitely persevered in, but daily administration is not necessary after the anæmia has disappeared.

LACTOGEN (Nestlé and Anglo-Swiss Condensed Milk Co., 6 and 8, Eastcheap, London, E.C.), modified dried full cream milk, is supplied in ti which contain the equivalent of four pints of milk with milk-sugar added. The recommendations for infant feeding are set out in tabular form in accordance with the age of the infant, and the warning is appended to the table that dilutions do not necessarily produce fluids of the equivalent composition of normal milk. Lactogen, though designed mainly as an infant food is also recommended as a properly constituted diet for invalids and convalescents, the manufacturers claiming that it is not merely a dried milk powder but that it is specially prepared to obtain proper physiological balance. Thus the addition of carbohydrate to the cream enriched fresh milk corrects a natural deficiency, while reducing the excess of protein. The addition of fresh fruit or vegetable juice is recommended, as supplying a needed accessory food factor.

NEOTROPIN (Messrs. Schering, Ltd., 3, Lloy avenue, London, E.C.) is a urinary antiseptic for administration, its chemical composition b butyl oxydiamino-azo-pyridin. The manufactu supply details of the procedure they have ad for testing the bacteriological efficacy of the and state that its use has proved considerable disinfectant of the urinary tract prior to su interference or in the post-operative treatment of surgical cases and in gonorrhœal affections.

BOTOL (Continental Laboratories, Ltd., 3 Marsham-street, London, S.W.).—This p consists of bromoform combined with codeine aconite, and belladonna, and is recommended pertussis and spasmodic or convulsive coughs. T preparation is supplied in tablet form, and should not be employed save under medical directions, but in suitable cases would be valuable.

Births, Marriages, and Deaths

BIRTHS.

BATTERSBY.—On April 18th, the wife of F. J. G. Battersby, of The Tower House, Malmesbury, Wilts., of a son.

LINDUP.—On April 15th, at Floriana Malta, the wife of Flight Lieut. C. A. Lindup, R.A.F. Medical Service, of a daughter.

MILLOY.—On April 23rd, at Wilbraham-place, S.W., the wife of John M. Milloy, M.B., F.R.C.S., of a son.

SEWARD.—On April 24th, at Southerhay West, Exeter, the wife of Charles Seward, M.D., M.R.C.P., of a daughter.

URWICK.—On April 21st, at Park-street, W., to Violet, wife of Dr. Desmond Urwick—a daughter.

MARRIAGES.

GOODWIN—CLAYTON.—On April 24th, at St. Mark's Church, Hamilton-terrace, N.W., Aubrey Goodwin, O.B.E., M.D., F.R.C.S., to Hilary, youngest daughter of Mr. and Mrs. C.E.H. Clayton, of Ruislip.

MARSHALL—BROWNE.—On April 23rd, at St. Saviour's Church, Warwick-avenue, W., Charles Wallace Marshall, M.D., to Helen Marion ("Gipsy") Browne, M.B., B.S.

DEATHS.

BEGG.—On April 21st, Charles Begg, M.B., C.M. (Edin.), in his 80th year.

BRAMWELL.—On April 27th, at Heriot-row, Edinburgh, Sir Byrom Bramwell, M.D., LL.D., D.C.L., in his 84th year.

KAY.—On April 22nd, suddenly, in London, Walter Smith Kay, M.D., of Harrogate, late Medical Superintendent of West Riding Mental Hospital, Wadsley, Sheffield.

TYRRELL.—On April 21st, in a nursing home, Walter Tyrrell, M.R.C.S., L.R.C.P., of Kensington Court-gardens.

WELSFORD.—On April 20th, in Rome, Arthur Gerald Welsford, M.D., F.R.C.S., aged 66.

YOUNG.—On April 25th, at King's College Hospital, after an operation, Colonel James Young, M.D., T.D., D.L., aged 6

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

ADDRESSES AND ORIGINAL ARTICLES

THE SPLEEN: ITS STRUCTURE, FUNCTIONS, AND DISEASES.*

BY J. W. McNEE, D.S.O., M.D., D.Sc. GLASG.,
F.R.C.P. LOND.,
ASSOCIATE PHYSICIAN TO UNIVERSITY COLLEGE HOSPITAL, LONDON.

LECTURE II.

I PROPOSE to describe first of all in this lecture the ore recent work on the functions of the spleen.

Functions of the Spleen.

CONTRACTILE POWER.

Contraction is the first and perhaps the most aportant function of the organ. The idea of splenic elaxation and active muscular contraction is not ew; it occurred to Stukeley (1722), and is clearly t forth in his Goulstonian lecture. Gray (1854) elieved the organ had a more passive rôle as a fety-valve for the portal blood, since his experi-ents, of which many were done on spleens freshly moved from the animal body, did not prove to m any active contraction. Roy (1881) was really e first physiologist specifically to investigate the ythmic movements and contractility of the spleen iring life, and his work was continued by Schäfer d Moore (1896). The results of the latter authors owed that the power of contraction of the spleen inherent in it, and may occur quite independently the nervous system. They also found that the olume of the spleen responds rapidly to alterations blood pressure, local and general, and that during phyxia general contraction and increased rhythmic ovement both ensue, but only so long as nerve ntrol is maintained. These last observations are much interest in view of Binet's more recent work, hich I shall describe presently. Stukeley's old iew of the spleen contracting as a pump was there-re gradually returning, and Mall (1900) states:—

> "I have found that in certain cases the pressure in the lenic vein may exceed the arterial, a condition which can brought about only in case the spleen contraction acts a pump. In one case the pressure in this vein rose to 0 mm. Hg, with the artery closed—i.e., the arterial essure practically at zero."

Study of the contractile power of the spleen there-ter remained in abeyance until about 1923–24, hen Barcroft and his colleagues in Cambridge began eir important series of observations. Barcroft's ork is now so well known that it is unnecessary to ve his methods in full detail, but it is interesting see how his research started. In an expedition to eru with a number of colleagues, to study the effects man of high altitudes, Barcroft was puzzled, even the voyage out, to account for the number of red rpuscles suddenly added to the blood as soon as ot weather was reached, and he was naturally also terested in the same phenomenon as it occurred high altitudes. Whence came this new blood tering the circulation quite suddenly? Obviously ly from some storehouse or reservoir where it ready lay available, and it was natural to think, had Stukeley before him, of the spleen. By a ries of ingenious experiments, and particularly by method in which a dog's spleen is brought out through a slit in the abdominal wall, and left active in situ, protected by saline dressings for weeks or months, he was able to show that the dog's spleen contracts actively under a variety of circumstances, such as exercise, heat, emotion. His experiments with carbon monoxide poisoning, already referred to, also showed conclusively the sudden emptying of the spleen-pulp during exercise. It may be remembered that the dog's spleen contains abundant muscle-fibre in its capsule, and contraction may be more definite in dogs than in other animals (and in man) in which the capsule contains elastic fibres only.

Binet and his colleagues in Paris (1926 onwards) have approached the same problem from a different angle. They had noticed, in experiments on animals with asphyxiating gases, a sudden rapid increase in the count of red corpuscles, which at first they could not explain. The increase is very rapid, and the blood count of an asphyxiated dog may rise 1,000,000 or even 2,000,000 per c.mm. within five minutes. Binet soon found that in animals from which the spleen had previously been removed, this increase in the blood count after asphyxiation failed to occur. A simulation of the effects of high altitudes (6000 metres) was also arranged in an experimental chamber, and here again precisely the same effects were noticed in the two classes of animals.

Thus the importance of the contractile power of the spleen as an ancillary respiratory organ, because of its powers of suddenly supplying additional oxygen carriers, appears to be amply proved.

Active contraction of the spleen has also been found to occur regularly after hæmorrhage, but Barcroft and his colleagues have shown that this contraction is most important and pronounced after a single experimental bleeding, and not when blood-loss is repeated. Thus the spleen, following a single hæmorrhage, may in a measure be regarded as an organ of auto-transfusion.

From all this important work on splenic contraction the following thesis emerges, which is well put by Barcroft in these words: "Were the organism presented with an issue which made its life depend on the amount of hæmoglobin it could produce, a splenectomised animal should die when an animal possessed of a spleen should survive." The correctness of this thesis was proved to the hilt by Barcroft in the following experiments. In animals poisoned with coal gas (carbon monoxide) splenectomised animals always die first, whereas in animals poisoned with hydrocyanic acid, in which the hæmoglobin is not involved, both normal and splenectomised animals die together.

While I cannot fail to be deeply impressed with the importance of the spleen as a ready and available source of red-blood corpuscles for sudden needs of the organism, I believe that the importance of the bone-marrow as an additional rapid supply of red corpuscles must not be lost sight of, especially after hæmorrhage. No one has suggested that the bone-marrow can act as a pump, and supply blood-cells by its contraction, but it seems evident from all our studies of the normal bone-marrow (quite apart from blood diseases in which the marrow is hyperplastic) that a large supply of red corpuscles is immediately available for any demand. This is shown by the appearance of the rapid post-hæmorrhagic leucocytosis, and by the presence of immature red corpuscles (normoblasts) in the blood very soon after a hæmorrhage. It seems possible that the supply from the bone-marrow is not so immediately available as that from the spleen, but none the less there must be in the normal bone-marrow a large store of ripe or nearly ripe red blood corpuscles which can be drawn into the general circulation at great speed.

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* The Lettsomian lectures delivered before the Medical Society London on Feb. 16th and 25th, and March 4th, 1931. Lect. I. peared last week.

The actual *mechanism of splenic contraction and relaxation* is of great interest. The older work of Roy, and of Schäfer, and Moore has already been referred to, but Binet and his colleagues in Paris have reinvestigated the problems involved by greatly improved methods. The problem narrows itself down essentially to questions of enzyme action, nerve control, or a combination of both. In view of the fact that the spleen is known to change its volume definitely during digestion, secretin has been considered as the possible enzyme involved. On the experimental evidence, however, secretin as an exciting cause of splenic contraction must be set aside, although in France this enzyme is now believed to have an important influence on the recently described cholesterogenic function of the spleen (Binet, Abelous and Soula), which is referred to later on.

By laborious experiments with a crossed circulation in two dogs, the head of one animal being transfused with the blood of another, Binet concludes that there is a centre for splenic contraction in the medulla, which acts by the stimulus of asphyxia or of changes in blood pressure. Obviously, as Binet admits freely, this central nervous mechanism is very complex, and far from being completely understood; the centre may indeed possibly be the ordinary vasomotor centre.

A second mechanism by which the spleen is made to contract is completely proved—namely, by the liberation of adrenalin into the blood. It is probably this mechanism which comes into play in exercise and emotion.

Thus, so far as our knowledge has gone, the spleen may contract both by enzyme action (adrenalin) and by the influence of central nervous control.

BLOOD FORMATION.

It is now generally accepted that in fœtal life the spleen, together with the liver, actually manufactures blood corpuscles of every variety, both erythrocytes and leucocytes. In post-uterine life a reversion to this fœtal function occurs in a variety of diseases of the blood, a good example being von Jaksch anæmia. This so-called myeloid metaplasia has been systematically studied by Naegeli and many others in human diseases, and also in experimental anæmias. Lymphocytes are believed to be supplied to the blood by the Malpighian bodies throughout life, but we have still much to learn concerning the physiology of the lymphatic tissues. Following splenectomy in most normal animals a definite anæmia supervenes, which has been fully described by Pearce, Krumbhaar, and Frazier (1918) in "The Spleen and Anæmia." The cause of this long persisting anæmia is not yet understood, but it is obviously an important fact to remember after the operation of splenectomy on our patients. Experiments on animals suggest that the anæmia is due to loss of some stimulating effect of the spleen on the bone-marrow, all the evidence being in favour of a diminished production rather than an increased destruction of blood. No immature cells are found in the circulating blood, and Krumbhaar and his colleagues have shown that in animals the anæmia can be rapidly improved by the injection of splenic extracts.

DESTRUCTION OF BLOOD AND PRODUCTION OF BILE-PIGMENT.

Blood destruction and the production of bile-pigment are so closely related that they may conveniently be considered together. The fact that red corpuscles are destroyed by phagocytic cells of the spleen-pulp, in health in some animals and in disease in man, owed its earliest recognition to Kölliker and Ponfick. We believe nowadays that this function of intracellular blood destruction is a function of the reticulo-endothelial system of cells, of which the spleen is an important centre, but not by any means the only one. It is also now believed that in this intracellular process of destruction of red blood-cells the iron-free part of the hæmoglobin molecule is released into the blood stream as bile-pigment, to be ultimately carried to the liver for excretion by the hepatic glandular cells. The question of bile-pigment metabolism is a large one, which I have dealt with very fully elsewhere (McNee, 1923).

BLOOD-PLATELETS.

The relation of the spleen to blood-platelet production and destruction, and consequently to blood coagulation, are matters of very considerable importance from the practical point of view, and it is unfortunate that our information about them is so meagre. The problem first attracted attention after the cure, by splenectomy, of severe cases of purpura associated with very low blood-platelet counts. The marked rise in the platelet count following operation in these cases suggests that the spleen may either destroy blood-platelets or influence their production in the bone-marrow, but we are entirely without information on this subject. The further importance of blood-platelets in patients about to be operated on for other splenic diseases emerges from the work of Rosenthal and Howel Evans, but this is referred to again in detail later.

DIGESTION.

It has been thought from the earliest times that the spleen was in some way related to the digestive processes, and indeed it was suggested in primitive medicine that the spleen "warmed the stomach." Later, even in the seventeenth century, alterations in nutrition and in appetite were described in splenectomised animals. The problems involved are very difficult, but, without going into details, it may be said that most recent studies have shown that the ordinary metabolic processes of digestion are in no way changed in animals after splenectomy. The question of fat metabolism has been particularly investigated, but Krumbhaar and Musser were unable to demonstrate any disturbance in the fat metabolism of spleenless dogs. It has been known for some time (MacAdam and Shiskin, 1922–23) that the cholesterol content of the plasma is reduced in both pernicious and secondary anæmias, but rapidly increases again in these diseases after splenectomy. Abelous and Soula have claimed, on the other hand, that the spleen has a definite cholesterogenic function in the body. They arrived at this conclusion while engaged in work with secretin. They noticed, for example, that when 100 c.cm. of 0·05 per cent. HCl is inserted into the duodenum of a normal dog the cholesterol in the carotid artery blood may rise from 1·153 to 2·307 g. per cent. This increase does not occur in splenectomised animals. It is impossible to reconcile these opposing results of MacAdam and Shiskin and Abelous and Soula, but it may simply be said that the problems of the relations of the spleen to digestion and particularly to fat metabolism urgently need complete reinvestigation. There are good clinical reasons for such a suggestion, as the results might possibly explain the peculiar metabolic disturbances of the reticulo-endothelial cells in Gaucher's disease and hypercholesterolæmic splenomegaly.

IMMUNITY.

There is some exact knowledge about the relation of the spleen to immunity, and many statements that are purely conjectural. It is well known, for example, that the spleen, liver, and lungs are the chief places in which micro-organisms circulating in the blood are arrested and destroyed. This is shown clinically in the spleen by the acute enlargement characteristic of many fevers, such as typhoid and infective endocarditis. At first these facts seemed in no way connected with the question of immunity, but with the development of knowledge concerning antibody formation and especially with the development of the conception of the reticulo-endothelial system and its cellular reactions in infective diseases, the question of the spleen's place in the processes of immunity in general and in antibody production in particular, has attracted renewed attention. Luckhardt and Becht (1911) showed that in splenectomised dogs hæmolysins, hæmoagglutinins, and hæmopsonins are not produced so rapidly or in such good concentration as in controls. Morris and Bullock (1919) in rats infected with rat-plague bacilli proved that in splenectomised animals the mortality was far higher than in controls. There is some evidence that in tuberculosis removal of the spleen increases resistance to infection (Lewis and Margot, 1914–15), but, on the other hand, Morton has provided us with a rapid method for the diagnosis of experimental tuberculosis in guinea-pigs by irradiation of the whole animal, which must certainly injure the reticulo-endothelial cells in the spleen and elsewhere.

Much work has recently been done on so-called "blockade" of the reticulo-endothelium by Indian ink and other methods, and the immunity response of such animals has been tested in comparison with controls. There is now practically a consensus of opinion that a real physiological blockade is impossible for any length of time, and so the many experiments which have been done lose force. On the whole it seems probable that the reticulo-endothelial system of cells are in some way connected with the processes of immunity to infection, and so the spleen, as the chief source of these cells, must be regarded as important.

An important clinical point emerges from this discussion on immunity—namely, whether infective diseases are commoner or are poorly resisted in splenless individuals. A case reported by O'Donnell (1929), and commented upon by Parkes Weber (1929), is of interest. The patient, a boy, died some time after splenectomy of an acute fulminating infection thought to be purpuric meningococcal septicæmia. It is very desirable that all such cases should be reported in the literature for the information of those interested in the subject. I may add that in none of my fairly large group of cases, in which splenectomy has been performed, has there been any evidence so far of lowered resistance to microbic infection.

TUMOUR FORMATION.

It is a well known clinical fact that malignant tumours, both primary and metastatic, are of unusual rarity in the spleen. Murphy (1914), inoculating chick embryo tissue with grafts of rat sarcoma, found that when the graft was accompanied by a fragment of kidney it survived and the two grew readily together, but that when spleen tissue was substituted for kidney the graft died. Lazarus-Barlow and Parry (1923) also found that the spleen offers more resistance to grafts of Jensen's rat sarcoma than does any other organ of the body. Thus both clinically and experimentally the spleen seems to offer resistance to tumour growth, and there must be some good reason for this if we could find it.

In my own experience malignant tumour growth has occurred in two patients on whom splenectomy had previously been performed. In the first of these, a woman of 28 years at the time of operation, carcinoma of the tongue developed three years later. In the second case, a woman of 34 years, carcinoma of the pharynx caused her death three and a half years later. It would be interesting to know how many cases of this kind could be collected.

Classification of Diseases of the Spleen.

In a previous paper (1929) I gave a preliminary account of the pathology of over 100 spleens, all of them belonging to the group which I then preferred to call "splenomegalies of unknown or uncertain origin." Since then my collection has greatly increased, and I have had more opportunities for clinical examination of patients, and histological examination of specimens obtained either by splenectomy or, in some cases, at necropsy.

At the time when my first paper was written I attempted, on the pathological evidence then available, to give a rough and entirely tentative classification of the splenomegalies of unknown or uncertain origin. It would have been better had I avoided the word classification, since all I was really able to attempt at the time was a grouping or "pigeonholing" of the spleens examined according to their chief histological characters.

TENTATIVE GROUPING—1929.

1. Splenomegaly with peri-ellipsoidal hæmorrhages and nodular siderosis (? splenic mycosis).
2. Chronic hæmolytic (acholuric) jaundice.
3. Thrombo-phlebitic splenomegaly.
4. Chronic splenic hypertrophy, with or without fibrosis.
5. Banti's disease. Rare.
6. "Reticulo-endotheliosis" of the spleen. (*a*) Slight (? chronic infections), or marked; (*b*) lipoidal group—diabetes, &c.; (*c*) Gaucher-Pick-Niemann group. (*d*) tumours.
7. Undetermined group: (?) chronic aleukæmic leukæmia; (?) primary lymphadenoma of spleen and others.

I did not mean this grouping to be considered as indicative of actual disease-entities. It may be noted, for instance, that the first group was termed "splenomegaly with peri-ellipsoidal hæmorrhages and nodular siderosis." This very interesting lesion (believed by some writers to be due to mycotic infection) occurs, as is now becoming well known and as indeed I stated in my paper, in a number of entirely different varieties of splenomegaly or splenic disease. It therefore cannot form the basis of anything more than a tentative histological grouping, since it seems possible that the cause of these siderotic nodules must be the same in whatever type of splenic disease they may be found.

In the past few years I have also had the opportunity of examining a number of other, and somewhat rarer, examples of splenic disease, and I now wish to attempt a wider and more generally applicable classification of all splenic diseases. My classification must be based on pathology, since we are still a long way from accurate differentiation of these diseases by clinical means. As I have stated before, enlarged spleens removed by the surgeon from patients with apparently identical clinical histories may yet be very different in histological structure.

A classification of this kind can take no note of two terms which stand out prominently in clinical literature—splenic anæmia and Banti's disease—although the use of these terms may well be inevitable in ordinary clinical use for some considerable time. A full account of the history of these terms has been given by Rolleston (1914). "Splenic anæmia" was first referred to in medical literature by Gretsel (1866), but there is no doubt that two papers by Osler, in 1900 and 1902, were the means of making the term familiar to clinicians in America and in Britain. The description "Banti's disease" came into use after the papers by this Italian author, who several times elaborated his views in the Italian, French, and German literature, and thus ensured them prominence. Osler, in a discussion on nomenclature, affirms that "Banti's disease is simply chronic splenic anæmia *plus* features of cirrhosis of the liver, which represents a terminal stage in the disease. Banti's merit consists in calling attention to this important aspect, but, after all, these secondary changes in the liver are somewhat rare, and, as my records show, the hæmorrhages, ascites, and even the jaundice may be present without existing cirrhosis."

The general classification of splenic diseases, which I hope may be useful for ordinary working purposes, is chiefly based on a differentiation of histological changes as they affect one or other of the different essential structural parts of the human spleen. Abnormalities, tumours, and specific infections fall readily into their own special groups. The chief constituent structures of the spleen are: (1) the myeloid and lymphatic elements; (2) the endothelial elements (reticulo-endothelial system); (3) the vascular system, with its special peculiarities; (4) the reticulum and supporting structures of the spleen—capsule, trabeculæ, &c.

No classification of this kind can be perfect or in absolute watertight compartments, and it may simply be mentioned as an example of this that inflammation of the capsule (perisplenitis) and chronic inflammation of the supporting tissues (chronic splenic fibrosis) are common to many splenic diseases. I am unable to affirm at present that chronic inflammation of the reticulum (a structure possibly composed of elements different from white fibrous tissue) is a precursor of, or takes part in, the phenomena of ordinary diffuse splenic fibrosis, but I strongly suspect this to be the case. Fibrotic thickening of the fibro-muscular trabeculæ is easily understood.

Here, then, is the general classification of splenic diseases which I propose:—

GENERAL CLASSIFICATION OF DISEASES OF THE SPLEEN.

1. Abnormalities: congenital and acquired.
2. Infections: acute; granulomatous; parasitic.
3. Diseases affecting the myeloid and lymphatic elements.
4. Diseases affecting the reticulo-endothelial elements.
5. Diseases affecting the vascular system.
6. Tumours: simple; malignant (primary and metastatic).
7. Combined diseases of the spleen, liver, and hæmopoietic system (Eppinger's "hepato-lienalen Erkrankungen"), and splenic enlargement in hepatic cirrhosis.

Some explanation is required for the inclusion of the last group, and it is impossible for me to consider the problems involved with any degree of clearness combined with brevity. It may be sufficient to say that Eppinger's well-known book, "Die hepato-lienalen Erkrankungen" (1920) runs to more than 560 closely printed pages. In general this group includes diseases in which there are obvious inter-relationships between liver, spleen, and bone-marrow, and seeks for some explanation of why hepatic cirrhosis and particular forms of splenomegaly are so often combined to form a characteristic clinical syndrome. This group of cases interests me very greatly, but in the present lectures brevity compels me to do little more than refer to them so as to bring them into line.

It is well known that the spleen is enlarged in the majority of cases of hepatic cirrhosis; as a rule the enlargement is not great, but in some instances the spleen may be enormous. In the latter cases, however, we are faced with extreme clinical difficulties, and even in the post-mortem room it may be impossible to solve the problem of whether the case should be regarded as primary hepatic cirrhosis and secondary splenomegaly, or the opposite.

In the ordinary moderate splenic enlargement of portal hepatic cirrhosis there seems little need to invoke more than the mechanical effects of portal back pressure in most cases, but the toxæmic view, in which it is held that both liver and spleen have been equally damaged by the same poison circulating in the portal blood, has had many adherents. The whole question of splenic enlargement in hepatic cirrhosis is fully discussed in the book on "Diseases of the Liver," by Sir Humphry Rolleston and myself (1929).

Diseases of the Spleen.

I now propose to describe in detail some of the chief diseases of the spleen met with in this country, and which I have seen myself. It is obviously impossible within the limits of these lectures to deal with *all* splenic diseases, and I must therefore omit or merely refer to a number of diseases of which I have so far no personal records, and others in which the spleen is involved only incidentally as part of some general disease. Examples of the latter are the leukæmias, Hodgkin's disease, and syphilis. I shall also leave out all direct reference to tropical diseases of the spleen, although it would be very interesting to see how they would arrange themselves in the classification proposed for splenic diseases in Britain.

For the above reasons this section is bound to appear somewhat ill-balanced, since important diseases in which the spleen is involved must be passed over almost in a word. But information about these diseases is readily available, and I have thought it best to devote most of my time to clinical and pathological conditions which are either specially interesting or difficult to interpret.

ABNORMALITIES—CONGENITAL AND ACQUIRED.

Malformations and lack of normal development are, on the whole, of little practical interest. The spleen may be completely absent, or very many small spleniculi may be found scattered through the upper abdominal cavity. A point worth mentioning, not for its immediate practical importance but for its bearing on other pathological changes, and for its confirmation of what I have already described as an essential fact in splenic structure, is *congenital lobularity* of the human spleen. Division of the organ into five to seven separate lobes has frequently been recorded (Litten), and incomplete lobulation, indicated by deep indentations on the surface, is not uncommon.

FLOATING SPLEEN.

Floating spleen, or dislocation of the spleen, is a well-known acquired abnormality, of definite importance in abdominal diagnosis. It is found, as would be expected, far more often in females than in males, and although it is true that the majority of floating spleens are enlarged spleens, this is not always so. A floating or wandering spleen is ultimately, in almost all cases, affected by perisplenitis or inflammation of the capsule, and then may fix itself permanently in almost any part of the abdominal cavity, even in the hollow of the pelvis. Prior to its fixation, twisting of the pedicle may ensue. If the twisting is sudden, symptoms and signs similar to those produced by the twisted pedicle of an ovarian cyst may be present, but on the other hand less sudden twisting may lead to splenic atrophy without further trouble. The clinical diagnosis of floating or dislocated spleen may be quite simple or excessively difficult. One case seen by me closely simulated a large pyloric tumour and was tender on palpation; ultimately, audible friction was heard over the tumour, which strongly suggested the correct diagnosis. In another case, in a male, seen quite recently, a diagnosis of wandering spleen was made at first because of great mobility of the tumour (which could be pushed up below the ribs) and a suggestion of a definite notch. X ray examination, however, strongly suggested the presence of carcinoma of the stomach, and a test-meal showed absence of free hydrochloric acid. At operation a large somewhat horseshoe shaped carcinoma was found involving the posterior wall of the stomach, not adherent to any adjacent structures, so that a partial gastrectomy was easily carried out.

PERISPLENITIS.

This is a convenient place to consider a very common complication of many splenic diseases—namely, perisplenitis. Inflammation of the capsule may follow injury by a blow, and is the common method of fixation of a wandering spleen, but in practical medicine it is chiefly of importance in splenic enlargements due to disease. There is no doubt that the presence of even well-marked acute perisplenitis is often overlooked, since pain may be slight or absent altogether, and the physician is often unaccustomed to applying his stethoscope over an abdominal tumour. Occasionally the friction is so rough that it may readily be detected by the hand placed on the abdominal wall.

In one case seen by me, which ultimately proved to be one of primary sarcoma of the spleen, the patient sustained a fall from his horse. A friction sound was heard on the left side, which was thought to be due to pleurisy from injury or fracture of the ribs. It was only some time later that the spleen was found to be considerably enlarged, but it now seems certain, in view of the dense adhesions subsequently found to exist, that the friction sound was due to perisplenitis and not to pleurisy.

It is a fact, however, and an important one for the surgeon, that perisplenitis producing the loudest rubbing sounds, and recurring for months, need not necessarily lead to permanent adhesions between the spleen and the abdominal wall. The adhesions when soft may evidently be, so to speak, polished off by the rubbing, leaving the affected area covered with a dense polished milky coating.

In one patient, a girl aged 10, an enlarged spleen offered great difficulties in diagnosis, since the blood count and blood picture were perfectly normal. Repeated attacks of perisplenitis in this active child led me to advise splenectomy before the operation became a graver risk from adhesions. Actually the spleen was removed without difficulty, the capsule being greatly thickened but well polished and the adhesions easily separated. This case is referred to again later.

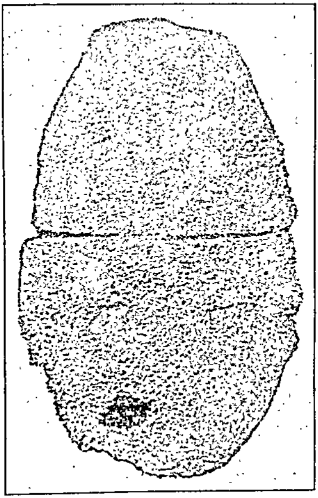
It is retrosplenic adhesions, and adhesions to the diaphragm, which are of far greater concern to the surgeon, since abundant vascular connexions are established which may give rise to oozing in deep places extremely difficult to control.

INFARCTION OF THE SPLEEN.

There is little need to do more than mention the extreme frequency of infarctions—both aseptic and septic, and varying greatly in size—in a number of diseases. The common occurrence of infarction is explained by our knowledge of the splenic vascular system, each of the main branches of the splenic artery being an end-artery in the truest sense, and supplying a potential splenic lobe. Each of the finer branches, moreover, supplies a potential lobule.

Total infarction of the spleen is rare, but may follow twisting of the pedicle of a wandering spleen.

FIG. 7.



Complete infarction of the spleen. (This specimen is now in the pathological museum of University College Hospital.)

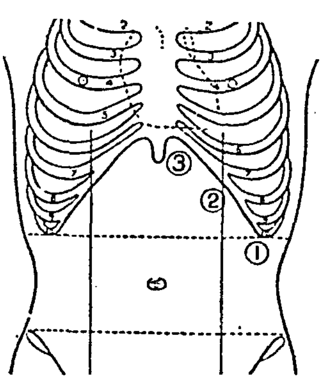
I have also seen a case of complete infarction, due to embolism of the splenic artery in a woman who had suffered from mitral stenosis and cardiac failure. The condition was only discovered at necropsy, and was not suspected during life.

The rarity of total splenic infarction, and the mechanism by which it may come about, has attracted the attention of Warthin (1901, 1907), Troell (1916), Richey (1918), and others, all of whom point out that in a normal animal ligature of the main artery does not result in infarction, but simply in gradual atrophy. The normal spleen apparently escapes necrosis because, although the branches of the vessel within the organs are true end-arteries, there are arterial anastomoses close to the hilum. Some additional factor such as disease of the spleen itself or definite abnormality in distribution of the blood-vessels must be present in order that blockage of the splenic artery should cause complete necrosis.

SPLENIC ENLARGEMENT IN FEVERS.

It is unnecessary to enter into any questions of pathology, since these are described in most textbooks. I shall confine myself to some simple clinical points in connexion with the diagnosis of early splenic enlargement. First, palpation of the tip of a slightly enlarged spleen is much easier in a broad-chested individual than in a patient with a narrow chest and acute costal angle, a point which I noted frequently when examining cases of trench fever during the later period of the war. I have, for example, examined a group of men from one platoon who fell ill together and were almost certainly infected about the same time. In the broad-chested men the spleen might be palpable, but not in the others. Secondly, it must be remembered that there are three places (see Fig. 8) where the hand should be placed to feel for a slightly enlarged spleen, and all three should be tried in turn before it is concluded that the spleen is of normal size. This point to some extent depends on the configuration of the individual, but also on the shape of the spleen itself.

FIG. 8.



TUBERCULOSIS, SYPHILIS, AND HODGKIN'S DISEASE.

I am unable to do more than mention the splenic enlargement in these three diseases. The matter is important chiefly in diagnosis, since apart from the spleen sharing the more generalised infection, massive tuberculosis of the spleen, or gumma, or what is believed to be primary invasion of the spleen by Hodgkin's disease, may all lead to considerable difficulty in the correct interpretation of a clinical case of splenomegaly.

SIMPLE HYPERTROPHY.

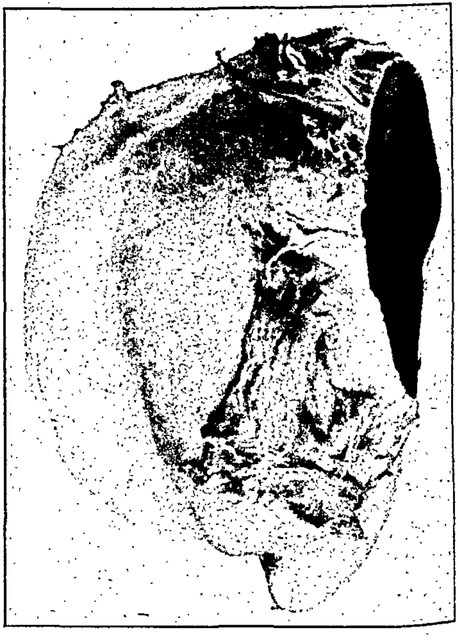
The size of the normal spleen varies considerably with age, as we have seen, but the cases I have in mind present themselves as definite splenomegalies associated with a secondary anæmia. Parkes Weber has suggested the descriptive term hypersplenism. In a patient of this kind, a young woman of 28 years, splenectomy was performed on a diagnosis of splenic anæmia. The spleen was considerably enlarged, but free from adhesions, and on histological examination I was unable to detect any abnormality whatever in its structure. I regard this case as one of pure splenic over-activity, resulting in anæmia. It was this patient who was readmitted to hospital three years later suffering from a large cancerous growth of the tongue.

CYSTS.

Three types of cysts in the spleen have been described: (1) dermoid, (2) echinococcus (hydatid), and (3) serous or hæmorrhagic. The two first mentioned are rarities, and I have not seen examples of either of them. Serous and hæmorrhagic cysts are the most important, especially in diagnosis and treatment. Small multiple serous cysts occur, but are of little practical importance and are generally found accidentally. It is the large hæmorrhagic cysts which may appear to the physician as cases of splenomegaly. It is stated in the literature that a definite history of trauma can often be elicited, and that the cysts are at first serous, and become hæmorrhagic from repeated injury. These points, are not well proven, and there are good reasons doubting them. It is certain that hæmorrhagic cyst may grow steadily, and attain to a large size. Th following is a brief synopsis of a case:—

The patient was a slim girl of 10 years, who was found have a very large spleen, reaching to below the umbilic and extending across the abdomen to the middle line. mass in this situation had first been noticed by a two years previously while the child was being exami during a minor illness. A year later the mass was definite larger, and could be seen as a prominence when the mo was bathing her child. Subsequently enlargement ap to have been progressive but slow. Apart from the enlargement the child was active and healthy, and blood counts and blood films failed to show any real a malities. I did not detect any fluctuation in the For a time nothing was done, since the child was so w and the diagnosis uncertain. Several well-marked attac of perisplenitis, with pain and rough friction, supervened and finally it was decided to remove the spleen. At t my colleague, Mr. Gwynne Williams, was not at all co vinced that the mass was the spleen, as he thought he co detect deep fluctuation in it, and the question of cyst kidney rose. A renal condition was therefore first rul out, and finally the spleen was removed without gr difficulty. It was found to be flattened out over an eno mous single cyst, the wall of which was extremely thin i some places but thick in others (Fig. 9). The contents o the cyst were chocolate in colour and like porridge in consistence. On allowing them to settle in a jar, a opalescent layer separated on top which contained abundant cholesterol crystals.

FIG. 9.



Large hæmorrhagic cyst of the spleen. (This specimen is now the pathological museum of University College Hospital.)

This case illustrates most of the important clinical points.

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(*Continued at foot of opposite page.*)

BACILLÆMIA IN EXPERIMENTAL TUBERCULOSIS,

TOGETHER WITH EXPERIMENTS ON MUTATION AND PATHOGENICITY OF A HUMAN STRAIN OF *B. tuberculosis*.

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Introduction.

IT is now probably generally accepted that in clinical and experimental tuberculosis a bacillæmia occurs at some stage of the infection, but the question of when it begins and how long it persists is still unsettled. In cases of generalised miliary tuberculosis it is obvious that the organisms have been carried by the blood stream. In cases where isolated tuberculous lesions occur, as in a kidney, testicle, or joint, and where there is no evidence of direct extension from another tuberculous focus, it is probable that the infection has been carried by the blood.

The first experimental work on this subject is probably that of Villemin (1868), who showed that normal rabbits injected subcutaneously with the blood of a tuberculous rabbit, or of phthisical patients, developed tuberculous lesions. Numerous investigations on the presence of *B. tuberculosis* in the blood have been made since that time, and the literature on the subject has been reviewed in detail by Ishiwara (1923), Calmette (1928), and by Löwenstein (1928). Recently, Bingold (1928) tested the blood of 43 patients, allowing the cells to sediment in 15 per cent. gelatin, and then spreading the deposit on egg medium. He obtained three positive results. Löwenstein and Russeff (1930) planted the centrifuged stroma of hæmolysed blood on a special egg medium containing asparagin instead of peptone. They obtained cultures in all cases of miliary tuberculosis, tuberculous meningitis, and third-stage pulmonary tuberculosis, and in six of eight cases of surgical tuberculosis. Löwenstein (1930) continuing this work, obtained positive blood cultures from 169 of 325 cases—*i.e.*, 52 per cent. His series includes tuberculosis of the lungs, skin, larynx, kidneys, bones, and eyes, and also 21 cases of acute rheumatism, all of which gave positive cultures.

Because of the technical difficulties of cultivating the organisms directly from the blood when they are present in very small numbers, the majority of investigators have had recourse to animal inoculation or to direct microscopic examination of the blood. The percentage of positive results has varied from 0 to 100. The methods based on the injection of the blood or some fraction of it into a test animal are satisfactory if there are sufficient organisms in the blood to infect the animal when doses of reasonable size are injected. Large doses of heterologous blood may be toxic for the guinea-pig, and any vigorous chemical treatment of the blood to concentrate the organisms may be harmful to them. The chief source of error in the direct microscopic examination of the blood is that acid-fast bacilli other than *B. tuberculosis* may be present on the glassware or in the distilled water or other reagent used for hæmolysing the red blood-cells. Another source of error is that small residual amounts of hæmoglobin may cause artefacts which may be mistaken for acid-fast organisms. Furthermore, if the number of acid-fast tubercle bacilli present is very small, as is frequently the case, it is necessary to examine a relatively large quantity of blood—a somewhat tedious procedure.

The relatively small number of successful attempts to obtain cultures directly from the blood is an indication of the difficulty of isolating *B. tuberculosis* on the usual media, and under the usual cultural conditions when only a few organisms are present. One source of difficulty in detecting *B. tuberculosis* in the blood or other pathological material has been revealed by the investigations carried out, particularly during the last few years, into the biology and morphology of this organism. The result of these researches has been to show that the acid-fast organism of Koch's classic description is not the only form in which *B. tuberculosis* occurs. The existence of forms of *B. tuberculosis* other than the usual acid-fast rod may be inferred from a consideration of certain types of tuberculous lesions—*e.g.*, cold abscesses, in which there are very few acid-fast bacilli, although the caseous material is highly infectious for experimental animals. In caseous pneumonia, and in early miliary tubercles, acid-fast organisms may be very rare, and no other organisms may be demonstrated in the histological sections. It is apparent that in such lesions the infecting organism is present in some form not readily demonstrable by the histological or optical methods available.

A considerable number of experiments on record tend to show that the material from such lesions contains a filtrable form of the tubercle bacillus,

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analogous to the filtrable viruses. Fontès described a filtrable variant of *B. tuberculosis* in 1910, but it was not until Vaudremer (1923) published the results of his experiments that any extensive interest in the subject was aroused. Since then Calmette, Valtis, and their colleagues have investigated the question, and their conclusions are summarised by Calmette (1930) and Calmette and Valtis (1930). The filtrability of the infecting agent in material from tuberculous lesions has been denied by several authorities—Gloyne, Glover, and Griffith (1929), Cooper and Petroff (1928), and others, and the matter cannot be regarded as finally settled. The literature on the subject has been reviewed by Cooper and Petroff (1928) and by Oluf Thomsen (1929). Löwenstein and Singer (1929) consider that up to the present time there is no stringent proof of the existence of filtrable forms of *B. tuberculosis.* The filtrability of any virus is, of course, a relative term, and unless the type of filter and the conditions of filtration are accurately specified, the value of the results is greatly reduced. The weight of evidence at present appears to be against the filtrability of the infecting material through the finer filters, such as Seitz and Chamberland L 5.

The existence of non-acid-fast forms of *B. tuberculosis* in culture has long been known, and numerous workers, using a great variety of media, have produced more or less non-acid-fast cultures, or have described non-acid-fast forms regularly appearing in cultures (Fontès, 1910; Vaudremer, 1927; Sweaney, 1928; Kahn, 1929). A great variety of non-acid-fast forms have been described, from filter-passing granules to mycelial and yeast-like forms. The variation may be due to a number of factors—different stages in the life-cycle of the bacillus, different media, different strains of bacilli, different methods of experiment, and different degrees of skill in distinguishing artefacts from organisms. The main result of these researches has been to relegate the tubercle bacillus of Koch's classic description to a comparatively minor place in the pathogenesis of tuberculosis. It appears to be a resting stage of the organism and possibly its least active form. If such non-acid-fast forms as occur in cultures were regularly present in pathological material, they should be easily identifiable by the usual bacterial stains. Such, however, is not the case, and it is unlikely that all the morphological types appearing under widely varying cultural conditions in vitro could be found in the relatively constant cultural conditions of the tuberculous lesion.

Experimental.

Culture experiments.—In the course of some experiments on the growth of *B. tuberculosis*, a certain human strain, TB 100, which had been propagated on artificial media for about 30 years, was grown in the depth of ordinary veal-peptone bouillon, prepared as follows:

> To 5 kilos minced lean veal add 10 litres distilled water. Boil 30 to 60 min. Filter. Add 100 g. Witte peptone and 50 g. NaCl. When the peptone and salt is dissolved, adjust the reaction to pH = 6·8. Boil 30 min. Filter through paper. Dispense 500 c.cm. quantities into litre flasks. Autoclave 10 min. at 10 lb. pressure.

A fairly heavy inoculum was submerged in this medium, and incubated for three months at 37° C., when the culture started to grow in the form of small granules at the bottom of the flask. The supernatant liquid remained clear, and there was no growth at the surface. The granules varied in size, up to about 2 mm. in diameter. When growth had started, a few of the granules were transferred to other flasks containing 500 c.cm. of the medium, by means of a Pasteur pipette. A series of subcultures has been carried on in this way for three and a half years, and during that time there has been no tendency to produce a typical surface growth. The rate of growth varies greatly in the different subcultures, probably depending on some uncontrolled factor in the medium. As a rule there is a definitely visible increase in the number of granules after three weeks, although the maximum growth may not be attained for three months or even longer. At times there may be an enormous increase in the number of granules, which remain quite small in size, while at other times the increase in the number of granules may be slight, but the small granules in the inoculum may grow to 3 or 4 mm. in diameter. In this case they usually become much darker in colour, whereas in the former type of growth the granules tend to be quite light in colour. Similar cultures have been obtained in the same way from two other strains of human origin, and from two strains of B C G, which are claimed to be of bovine origin. Cultures grown in this way *in the depth of the bouillon are referred to throughout* this paper as "deep cultures."

Microscopically, the granules in the deep cultures consist of acid-fast rods together with a considerable proportion of non-acid-fast organisms. If a smear of a small granule is stained by Ziehl-Neelsen in the usual way, and counterstained with methylene-blue or malachite-green, there is considerable variation in the amount of stain retained by the acid-fast bacilli and in the intensity with which the non-acid-fast bacilli take up the counterstain. Some of these are a deep blue, while others are so faintly stained that they can be distinguished only with difficulty. If instead of counterstaining in the usual way, a wet preparation is made by placing a drop of dilute methylene-blue on the fixed smear previously stained with carbol-fuchsin and decolorised with 25 per cent. H_2SO_4 and alcohol, and a coverslip placed over the methylene-blue, *a much greater proportion of non-acid-fast organisms can be seen.* There is still considerable variation in the intensity of staining, some being only faintly tinged, while others are a deep blue. The depth of colour continues to increase for about an hour after the stain is put on the slide, and more and more organisms take up the stain and become visible as time goes on. If a certain field be marked, and then the coverslip removed, and the excess stain washed off with distilled water and the marked field re-examined, it will be seen that the greater number of very faintly staining rods, and even some of those more deeply stained, have lost their stain and are no longer visible. On adding another drop of methylene-blue and replacing the coverslip they again come into view. These faintly staining rods, even when treated for 24 hours at 37° C. with a 1 per cent. solution of methylene-blue, fail to retain the stain on subsequent washing with distilled water.

If a thin preparation from an actively growing culture be examined in the wet stain, numerous pairs of bacilli in a "V" or parallel arrangement may be seen, of which one is usually more or less acid-fast, while the other has taken up the counterstain. The non-acid-fast rod may vary in size and intensity of staining from a very thin, pale, scarcely visible rod to a deep blue bacillus as large as the acid-fast one to which it is attached. This arrangement occurs so regularly that it seems highly probable that the non-acid-fast member has grown directly from the acid-fast one, and that it increases in size and intensity of staining with age. In the very early stages it takes up very little, if any, stain even in a wet preparation, and does not retain the stain at all when washed with water.

Similar "chromophobic" bacilli may be found, but to a less extent, in most cultures of *B. tuberculosis* grown on the usual media. Also, they can frequently be detected in wet-stained histological sections of tuberculous tissue, but in this case it is difficult to differentiate them with certainty from tissue debris. We are of the opinion that these non-staining organisms are of the greatest importance in the biology of the tubercle bacillus, and in the ætiology of rapidly progressing tuberculous lesions. The bacterial cells in the early stages, whether growing in culture or in a tuberculous lesion, are incapable of taking up and fixing the stain. In this stage they are so small that it is possible that they might pass through a filter which would hold back most bacilli. As they increase in size and age they acquire the property of fixing the stain, and eventually become acid-fast. They may, however, reproduce, giving rise to other "chromophobic" rods long before the acid-fast stage is reached.

From the study of four strains of *B. tuberculosis* which we have grown and examined in this way, we have never obtained any evidence that, under the conditions of our experiments, the microscopic granules which are occasionally seen are anything other than fragments of degenerating or dead bacilli. This is in accordance with the findings of Gardner (1929).

VIRULENCE OF DEEP CULTURES.

Cultures of *B. tuberculosis* grown in the manner above described were occasionally, but by no means invariably, very much more virulent than cultures of the same strain grown on Petroff's medium. The first strain studied, TB 100, is not usually highly virulent, as has been evident from a number of experiments in which it has been used during the last ten years. A typical example of its low virulence is shown in Expt. 1. Its mutation to a more virulent organism is shown in Expts. 2 and 3.

EXPT. 1 (July 4th, 1927).—Six guinea-pigs were injected subcutaneously on this date with 1/25th mg. of a 12 days' old culture of TB 100 on Petroff's medium. This dose contained about 1,600,000 bacilli. Five of these guinea-pigs *died in* 283, 342, 366, 670, and 794 days respectively. The sixth guinea-pig, three years after the injection, was in good condition and showed no evidence of infection other than enlarged inguinal and axillary glands, and a weak intradermal reaction to old tuberculin. It was killed 1269 days after infection. The post-mortem findings of these animals are recorded in Table I.

EXPT. 2 (Feb. 6th, 1928).—In this experiment the fifth deep subculture in bouillon of TB 100 was used. In the culture, 60 *days old, there was no typical surface growth*, but on careful examination by reflected light a very thin film resembling a film of dust could be seen on the surface of the bouillon. By transmitted light it was invisible. No acid-fast organisms were found in a loopful of this film. Some of the film was skimmed off, taking care not to disturb the granules at the bottom of the flask. Fresh bouillon flasks were inoculated with part of this material, and the remainder shaken up to obtain a homogeneous suspension, and used *for the injection of eight* guinea-pigs, Nos. 226 to 233. Two of the guinea-pigs injected subcutaneously with 1 c.cm. died 16 days later, with an intense hyperæmia of the intestines, but no visible tuberculous lesions. A few acid-fast bacilli were found in the inguinal glands, but none in any organ. Cultures of the heart blood were made in bouillon and glycerin bouillon, and on agar, serum agar, and Petroff's medium. Within three days there were tiny colonies of *B. tuberculosis* visible on the solid media, and the clot in the liquid media contained innumerable acid-fast bacilli. The cause of death in these animals was, therefore, an acute *B. tuberculosis* septicæmia. The remaining guinea-pigs survived the acute phase of the infection. Three, killed after 23, 37, and 348 days respectively, had typical tuberculous lesions. The other three *survived for* 423, 591, and 900 days respectively, and had very slight lesions *post mortem*. (Table I.).

EXPT. 3 (Feb. 29th, 1928.)—One of the bouillon flasks which had been inoculated with the *film from the fifth* deep subculture used in Expt. 2 showed a similar film and a very slight powdery sediment after three weeks' incubation. This flask was shaken up to obtain a homogeneous suspension of the film and sediment. Ten c.cm. of the suspension was centrifuged, and the whole of the deposit smeared on two slides. After staining by Ziehl-Neelsen, the whole of each smear was carefully examined. The total number of acid-fast organisms *in the two slides* was 36—i.e., 3·6 per c.cm. Numerous faintly staining rods were seen in a wet methylene-blue preparation. Twenty guinea-pigs were inoculated subcutaneously *with* 2 *c.cm. of* the suspension—i.e., probably seven to eight acid-fast organisms, and an undetermined number of "chromophobic" bacilli. Two, killed after 6 and 57 days respectively, had only slight tuberculous *lesions*, but cultures of *B. tuberculosis* were readily obtained from the heart blood. No. 321 died of acute generalised miliary tuberculosis in 15 days; the blood culture was positive. Practically all the animals lost weight rapidly and became limp, but the majority survived the *acute phase* of the infection. Six died in 255, 525, 583, 502, 643, and 805 days respectively. Eleven are still alive, 34 months after infection. (Table I.).

TABLE I.—*Guinea-pigs Infected with Various Cultures of TB 100.*

G.-p. No.	Dose and route of injection.	Days lived.	TB. in blood culture	Post mortem.
		Expt. 1.—July 4th, 1927.		
97	1/25 mg. s.c.	342	†	G.T.
98	,,	366	†	Slight G.T.
99	,,	794	0	No macroscopic lesions.
100	,,	283	††	Mesenteric, sternal, and inguinal glands TB. †
101	,,	1260 K	*	Extensive cirrhosis of liver. Inguinal and axillary glands. TB. †
102	,,	670	0	Slight G.T.
		Expt. 2.—Feb. 6th, 1928.		
226	1 c.c. s.c.	37 K	††	Slight G.T.
227	{2·5 c.c. i.p. + 2·5 c.c. s.c.}	348 K	(†)	Paralysed. Chronic G.T.
228	1 c.c. s.c.	594	††	Tubercles in lungs.
229	{2·5 c.c. i.p. + 2·5 c.c. s.c.}	23 K	††	Miliary tubercles in lungs and spleen.
230	1 c.c. s.c.	423	*	No macroscopic lesions.
231	,, ,,	900	*	Inguinal glands and nodule at site of injection TB.†
232	,, ,,	16	†††	Hyperæmia of intestines; inguinal glands. TB.†
233	,, ,,	16	†††	Hyperæmia of intestines; inguinal glands. TB.†
		Expt. 3.—Feb. 29th, 1928.		
308	2 c.c. s.c.	Alive.		
309	,, ,,	525	0	Chronic G.T.
310	,, ,,	57 K	†††	Slight lesions in lungs and liver; inguinal and mesenteric glands. T.B.†
311	,, ,,	583 K	0	Paralysed; chronic G.T.
312	,, ,,	592	††	Lungs congested; right supra-renal *T.B.*†
313	,, ,,	6 K	†††	Very early tubercles in lungs.
314	,, ,,	805	*	}Small healed lesions in lungs.
315	,, ,,	255	*0*	
316	,, ,,	643	†	Chronic G.T.
317	,, ,,	Alive.		
318	,, ,,	,,		
319	,, ,,	,,		
320	,, ,,	,,		
321	,, ,,	,,		
322	,, ,,	,,		
323	,, ,,	,,		
324	,, ,,	15	††	Generalised miliary T.B.
325	,, ,,	Alive.		
326	,, ,,	,,		
327	,, ,,	,,		

The explanation of the sign (†) is given in the text on p. 1020.

s.c. = subcutaneously; i.p. = intraperitoneally. GT. = generalised tuberculosis. *TB*† = *B. tuberculosis present.* K. = killed. * = no culture taken.

Expt. 1.—TB 100 culture on Petroff's medium, 12 days old.

Expt. 2.—Film from surface of fifth deep subculture of TB 100, 60 days old.

Expt. 3.—Sixth deep subculture of TB 100, 23 days old.

EXPT. 4 (Feb. 29th, 1928.)—Two groups of three rabbits were injected intravenously in the left ear with doses of 2 c.cm. and 5 c.cm. respectively of the same suspension used in Expt. 3. They were bled for culture from the marginal vein of the right ear on March 19th, 1928, 19 days after infection, and cultures of *B. tuberculosis* were obtained from all. They were bled again 33 days after infection, and positive cultures were obtained from four of the six rabbits. The finding of positive blood cultures 19 and 33 days after injection of a human strain of *B. tuberculosis* to which the rabbit is highly resistant indicates that these organisms, when introduced, not only survive but multiply at a considerable rate, probably in the "chromophobic" stage. The total number of acid-fast bacilli injected into each animal was less than 20—i.e., one bacillus to about 5 c.cm. of blood. As the amount of blood taken for culture was only about 0·25 c.cm., it is obvious that the acid-fast bacilli actually injected, if they all remained evenly distributed in the circulation, would be insufficient to account for the positive blood cultures. Three of these rabbits which died, and one which was killed, had no visible tuberculous lesions. The other two are still living. (Table II.).

TABLE II. (Expt. 4, Feb. 29th, 1928).—*Rabbits Infected Intravenously with Sixth Deep Subculture of TB 100.*

Rabbit No.	Dose (c.cm.)	TB in blood culture.		Days lived.	Post mortem
		19/3/28	2/4/28		
154	5	†	0	Alive 8/1/31	—
155	5	†	†	"	—
156	5	†	†	70 (K.)	No macroscopic TB.
157	2	†	†	526	
158	2	††	†	939	
159	2	†	0	172	

Considering the low degree of virulence of TB 100, as seen in Expt. 1, where the infecting dose of 1/25th mg. contained about 1,600,000 bacilli, yet none of the guinea-pigs died acutely, it seems improbable that the very small number of acid-fast organisms—from 4 to 20—present in the infecting doses of the cultures used in Expts. 2 and 3 would be sufficient to cause the lesions found in some of the guinea-pigs. The non-acid-fast "chromophobic" bacilli in the cultures were therefore probably the cause of the infection in these animals. The type of infection produced in some of these guinea-pigs is analogous to the clinical type of tuberculosis first described by Landouzy in 1883 as "typho-bacillose" (Landouzy, 1908). Clinically, this is an acute infection resembling enteric fever, rarely fatal in the acute stage, but some time after an apparent recovery the patient develops well-defined, typical tuberculous lesions in some organ. If death occurs in the acute phase, no typical localised tuberculous lesions are found, but only the diffuse congestion and degeneration common to all acute septicæmias.

Guinea-pigs 232 and 233, which died 16 days after infection without localised tuberculous lesions, but with a *B. tuberculosis* septicæmia, are examples of fatal termination in the acute phase. The others survived the acute phase during which they became limp and lost weight. Some of these eventually developed typical tuberculous lesions, while a few have apparently recovered.

Rapidly developing fatal tuberculous septicæmia in experimental animals inoculated with *B. tuberculosis* is probably a more common experience than is usually recognised. In the course of experiments during the last eight years, numerous groups of guinea-pigs have been infected with various strains of *B. tuberculosis*. A certain number of these animals have died within 3 to 18 days, showing no sign of tuberculous lesions, and either none or very few acid-fast bacilli in the glands and organs. The characteristic post-mortem appearance has been an intense hyperæmia of the abdominal viscera, with occasionally some hyperæmia or congestion of the lungs. Cultures of the heart blood in bouillon were regularly made from these animals, to ascertain whether or not death was due to an intercurrent infection. These cultures remained clear after 14 days, and as platings from them showed no growth, they were rejected as sterile. However, in the absence of any evidence of secondary infection, or of other obvious cause of death, the death has been ascribed to the tuberculous infection. The first positive evidence that these deaths were due directly to the *B. tuberculosis* was obtained from the positive blood cultures from the two guinea-pigs above mentioned, Nos. 232 and 233.

Tuberculous infection of this acute type has been described by Jousset (1908), who reported rapid death without typical tuberculous lesions in 15 of 100 guinea-pigs. He found *B. tuberculosis* in the blood of these animals, both microscopically and by the injection of other guinea-pigs. Three similar cases of premature death in guinea-pigs infected with tuberculous material have been reported by Brindeau, Cartier, and Pougin (1930). These authors agree with Jousset that in the testing by animal inoculation of suspected tuberculous material, one may be misled by this atypical course of the infection.

A factor of considerable importance in experiments involving tuberculous infection in guinea-pigs is clearly seen in our own and other experiments, which show that quite apart from any question of the virulence of the infecting organism, there is an enormous difference in susceptibility between individual animals of the same stock, and in some cases, even of the same litter and the same sex. In Expt. 3, for example, where 20 guinea-pigs, all white, of the same stock, were injected subcutaneously with 2 c.cm. of the same suspension, one died in 15 days with generalised miliary tuberculosis; six died in from 255 to 805 days, and 11 are still alive after [illegible] months. In an important paper by Uhlenhuth and Seiffert (1930), dealing with experiments on tubercle bacilli of low virulence, including B C G, attention is drawn to this very striking difference in the sensitivity of guinea-pigs.

Blood Cultures.

Since obtaining cultures of *B. tuberculosis* from the blood of the two guinea-pigs Nos. 232 and 233, cultures from the heart blood have been taken as a routine from practically all animals dying after infection with *B. tuberculosis*. In the course of this work it was found that solid media were not very suitable, cultures being rarely obtained on Petroff's medium or on glycerin agar unless there was a massive infection in the blood stream, and even in these cases the growth appeared to be better in the liquid media. For all the later work, bouillon and glycerin bouillon alone were used. The post-mortem technique followed in making the cultures is as follows:

The skin of the animal is reflected from the thorax and abdomen without opening either the thoracic or abdominal cavities. The thorax is then opened with sterile instruments, the heart seized with sterile forceps, the pericardium opened, and the surface of the ventricles seared with a hot iron. One of the ventricles is then punctured with a Pasteur pipette, and the blood is withdrawn. This technique may be applied only if the autopsy is made soon after death. If the animal has been dead long enough to allow the blood to coagulate, the apex of the heart is cut off, and a portion of the clot removed with sterile forceps. From 0·1 to 0·5 c.cm. of blood is added to 10 c.cm. of bouillon. Positive results have been obtained with quantities of 0·1 to 1 c.cm., but 0·3 to 0·5 c.cm. is probably the most suitable amount. After incubating for 14 to 60 days at 37° C., the clot, or a portion of it is crushed between two slides, smeared out, dried, fixed by gentle heating, and stained by Ziehl-Neelsen.

If no acid-fast organisms are found in the small portion of the clot thus examined, the whole clot is treated according to the method of Douglas and Meanwell (1925) for demonstrating *B. tuberculosis* in milk, pus, &c.

In staining smears of the clot, the hæmoglobin tends to resist decolorisation, and the preparations are not always satisfactory. The following modification of the staining procedure gave better results. Fix by gentle heating. Pour on carbol-fuchsin and heat until the steam rises; leave for 5 to 10 minutes. Wash in water. Treat with 25 per cent. H_2SO_4 for 30 to 60 seconds. Wash in water. Treat with a saturated solution of picric acid in 95 per cent. alcohol until no more red colour comes out. Then wash in acetone until no more red colour comes out. If necessary, repeat the treatment with picric acid and acetone. The smear usually retains enough picric acid to act as a counter-stain, but if it does not appear yellow, it is stained for 30 seconds in a half saturated aqueous solution of picric acid.

In the later experiments, direct smears of the heart blood have been examined for *B. tuberculosis* if the blood had not coagulated before the post-mortem examination. The technique used is as follows: A reasonably thick, even film of blood is made by the usual method of preparing blood films, and dried for 30 minutes in the incubator at 37° C. Fix very lightly by flaming. Wash very carefully in distilled water, or in 1 per cent. acetic acid until the hæmoglobin is entirely removed. This can only be done if the slide is not too dry. Dry again in the incubator. Fix by flaming, and stain by Ziehl-Neelsen, using picric acid as a counterstain. Occasionally, acid-fast bacilli could be detected, usually within the leucocytes.

TABLE III.—*B. Tuberculosis in Blood of Guinea-pigs Infected with Various Cultures of B C G.*

Expt. No.	G.-p. No.	Dose and route of infection.	Days lived.	TB in blood culture.	Post-mortem.	Expt. No.	G.-p. No.	Dose and route of infection.	Days lived.	TB in blood culture.	Post-mortem.
5	476	mg. 2 ip	33	††	G. T.	6A	727	(a)	200 K	(†)	H. L.
	477	2 ,,	39	††	,,		728	(b)	200 K	†	G. T.
	478	2 ,,	62	††	,,		729	(c)	155	†	,,
	479	5 ,,	33	††	,,		730	(d)	200	†	,,
	480	5 ,,	39	††	,,						
	481	5 ,,	37	††	,,	6B	752	(e)	194	†	,,
	482	10 ,,	39	††	,,		753	(f)	109	†	,,
	483	10 ,,	25	†	,,		754	(g)	136	—*	,,
	484	10 ,,	31	†	,,		755	(h)	144	††	,,
	485	20 ,,	33	††	,,		756	(i)	122	†††	,,
	486	20 ,,	40	†	,,		757	(j)	175	†	,,
	487	20 ,,	40	†	,,						
6	519	0·1 ,,	56	(†)	,,	6C	797	mg. 1 sc	98	0	,,
	520	0·1 ,,	48	(†)	,,		798	1 ip	36	††††	,,
	521	0·1 ,,	47	(†)	,,		799	0·1 sc	149	††	,,
	522	0·1 ,,	56	(†)	,,		800	0·1 ip	46	††	,,
	523	1 ,,	50	†	,,		801	1 sc	92	†	,,
	524	1 ,,	49	†	,,		802	1 ip	35	††	,,
	525	1 ,,	49	††	,,		803	0·1 sc	117	0	,,
	526	1 ,,	86 K	†	G. T.*		804	0·1 ip	269	0	,,
	527	2 ,,	93	†	G. T.		805	1 sc	83	†	,,
	528	2 ,,	41	†	,,		806	1 ip	25	†	,,
	529	2 ,,	44	†	,,		807	0·1 sc	177	†††	,,
	530	2 ,,	45	†	,,		808	0·1 ip	39	††	,,
	531	5 ,,	122	†	,,						
	532	5 ,,	37	††	,,						
	533	5 ,,	39	†	,,						
	534	5 ,,	30	††	,,						

* Paralysis.

—* No culture taken. K. = Killed. sc = Subcutaneously. ip = Intraperitoneally.

(a) Blood culture from G.-p. 521 subcutaneously.
(b) Ditto from 533 subcutaneously.
(c) ,, ,, 532 ,,
(d) ,, ,, 534 ,,
(e, f) Lung of G.-p. 526 subcutaneously.
(g h) Testis of ,, ,, ,,
(i j) Omentum ,, ,, ,,
H L Small healed and healing lesions in lungs.

Expt. 5.—Second deep bouillon subculture of B C G (1) 34 days old.

Expt. 6.—Fourth deep bouillon subculture of B C G (1) 11 days old.

Expt. 6A.—Blood cultures from four guinea-pigs in Expt. 6 injected subcutaneously.

Expt. 6B.—Suspensions of organs of G.-p. 526 injected subcutaneously into fresh guinea-pigs.

Expt. 6C.—Cultures of *B. tuberculosis* recovered from testis and lung of G.-p. 526. Ten days old subcultures injected into fresh guinea-pigs.

In some cases enormous numbers of acid-fast bacilli were found in the blood cultures within a few days, although none, or very few, could be found by direct examination of the blood. In these cases it appeared highly probable that large numbers of *B. tuberculosis* in a non acid-fast "chromophobic" stage were present in the blood, and that these rapidly developed acid fastness under the conditions existing in the blood cultures.

From the experiments with TB 100 it was apparent that *B. tuberculosis* was very frequently present in the blood of guinea-pigs which had died of tuberculosis, or which were killed at an earlier stage of the infection;

TABLE IV.—*Expt. 7.*

	Vaccinated Guinea-pigs infected May 25th, 1928, with 1/25 mg. B. tuberculosis Cockhorn (Bovine) intraperitoneally.				*Control Guinea-pigs infected intraperitoneally May 25th, 1928, with 1/25 mg. B. tuberculosis Cockhorn (Bovine).*			
Group	G.-p. No.	Days lived.	TB in blood culture.	P.M.	G.-p. No.	Days lived.	TB in blood culture.	P.M.
1	235	39	†	G. T.	267	38	††	G. T.
	236	34	†††	,,	268	31	†††	,,
	237	39	0	,,	269	46	††	,,
	238	179	0	,,	270	46	††	,,
	239	36	†††	,,	271	31	††	,,
	240	68	†	,,	272	38	††	,,
	241	61	†	,,	273	37	†	,,
	242	55	0	,,	274	45	0	,,
	243	251	0	,,	275	54	††	,,
	244	124	†	,,	276	44	†	,,
	245	42	0	,,	277	60	††	,,
	246	40	0	,,	278	33	†††	,,
	247	50	†	,,	279	43	†	,,
	248	46	†	,,	280	14	††	T. P.
	249	38	†	,,	281	116	0	G. T.
	250	47	(†)	,,	282	31	†††	,,
2	251	130	†	,,	283	68	†	,,
	252	46	(†)	,,	284	45	†	,,
	253	4	0	P. P.	285	31	†††	,,
	254	46	†	G. T.	286	95	(†)	,,
	255	2	0	P. P.	287	191	†	,,
	256	320	0	C. G. T.	288	3	†	P. P.
	257	59	0	G. T.	289	33	†††	G. T.
	258	36	†	,,	290	50	†	,,
	259	34	†	,,	291	31	††	,,
	260	72	††	,,	292	36	†††	,,
	261	38	†	,,	293	31	††	,,
	262	60	†	,,	294	127	†	,,
	263	71	††	,,	295	70	(†)	,,
	264	53	†	,,	296	22	(†)	,,
	265	55	0	,,	297	160	0	,,
	266	18	†	T. P.	298	31	†	,,
3	342	142	†	G. T.	372	95	†	,,
	343	26	††	,,	373	4	†	P. P.
	344	29	†	,,	374	48	†	G. T.
	345	47	††	,,	375	62	†	,,
	346	41	††	,,	376	37	†††	,,
	347	2	†	P. P.	377	43	†	,,
	348	50	††	G. T.	378	134	††	,,
	349	40	††	,,	379	36	†††	,,
	350	52	††	,,	380	27	†††	,,
	351	4	††	P. P.	381	96	†	,,
	352	4	†	,,	382	46	†	,,
	353	40	†	G. T.	383	34	†††	,,
	354	40	†	,,	384	293	0	C. G. T.
	355	42	†	,,	385	28	†	G. T.
	356	23	†	,,	386	44	†	,,
4	357	45	(†)	,,	387	39	†	,,
	358	45	†	,,	388	44	†	,,
	359	44	†	,,	389	60	††	,,
	360	25	†	,,	390	26	††	,,
	361	31	††	,,	391	93	†	,,
	362	46	†	,,	392	36	†	,,
	363	211	0	,,	393	46	†	,,
	364	42	†	,,	394	37	†	,,
	365	41	†	,,	395	54	†	,,
	366	37	†	,,	396	2	†	P. P.
	367	2	0	P. P.	397	36	†	G. T.
	368	4	0	,,	398	31	†	,,
	369	40	†††	G. T.	399	25	†	,,
	370	38	††	,,	400	46	†	,,
	371	22	†	,,	401	39	†	,,

Pp. = pneumococcal peritonitis; C. G. T. = chronic G. T.; T.P. = tuberculous peritonitis.

and that cultures could be obtained readily in bouillon by a very simple procedure. To confirm this, blood cultures were subsequently made, post mortem, from the heart blood of practically all guinea-pigs which had been infected with cultures of *B. tuberculosis* for various purposes. The results of these experiments are shown in Tables III. and IV., and a summary of all the blood cultures is shown in Table V. Expts. 5, 6, 6A, 6B, and 6C refer to guinea-pigs infected with cultures of B C G. These experiments were part of an investigation dealing with mutations and pathogenicity of B C G, and are reported in detail in another paper (Dreyer and Vollum, 1931). They are briefly summarised in Table III. to complete the record of the work on blood cultures.

TABLE V.—*Summary of Results of Examination of Blood Cultures.*

Expt. No.	Strain of TB.	Blood cultures.			
		Positive.		Negative.	
		Number of guinea-pigs	Average life.	Number of guinea-pigs	Average life.
1*	TB 100	3	330	2	732
2*	,,	3	209	0	—
3*	,,	3	417	2	390
1 + 2 + 3	,,	9	319	4	561
5	B C G	12	38	0	—
6	,,	16	56	0	—
6A	,,	4	189	0	—
6B	,,	5	147	0	—
6C	,,	9	76	3	161
7, controls	Cockhorn.	55‡	50	4	154
7, groups 1 and 2	,,	21‡	55	9	116
7, groups 3 and 4	,,	24‡	54	1	211

Total Cultures Examined, including Cultures from Animals Killed.

Strain of TB.	Positive cultures.	Negative cultures.	Total.	Per cent. positive.
TB 100	14	5	19	73·7
B C G	46	3	49	93·9
Cockhorn controls	55‡	4	59	93·2
,, groups 1 and 2	21‡	9	30	70·0
,, ,, 3 and 4	24‡	1	25	96·0
Total	160	22	182	87·9
Total excluding immune groups 1 and 2 of Expt. 7	139	13	152	91·4

* Excluding animals killed during the experiment.

‡ The 10 guinea-pigs which died in two to four days after infection, from pneumococcal peritonitis have been excluded from the calculations of the average life times, and of the percentage of positive blood cultures. Of these 10, however, positive blood cultures were found in 6.

In Expt. 7 (Table IV.) an attempt was made to immunise guinea-pigs with killed cultures of *B. tuberculosis*. Groups 1 and 2 were immunised with an antigen prepared from a mixture of nine different cultures of human strains of *B. tuberculosis* grown for three to six months on non-glycerinated bouillon containing a small amount of some growth stimulating substance such as yeast autolysate, bacterial extracts, bios, serum, orange-juice, or potato-juice. The growth was filtered off, washed with distilled water and acetone, extracted with acetone in a Soxhlet apparatus for 24 hours; treated with 1 per cent. formic acid in formalin for 24 hours at 56° C., and again extracted with acetone in a Soxhlet apparatus for 24 hours. The bacterial mass was then dried, ground, and suspended in saline containing 0·08 per cent. commercial formalin. The animals were given three doses of 1, 2, and 5 mg. respectively on Feb. 14th, 21st, and 28th, 1928. Group 1 were injected intraperitoneally, and group 2 subcutaneously. Fourteen rabbits were injected intravenously with similar doses of the antigen at the same time. The guinea-pigs were tested intradermally with old tuberculin on April 2nd, 1928, and all gave a strong positive reaction.

For the immunisation of groups 3 and 4, the non-acid-fast culture of TB 100 used to infect the guinea-pigs in Expt. 3, was killed by the addition of 0·1 per cent. formalin, and doses of 2, 3, and 5 c.cm. respectively were given on March 22nd, April 2nd, and April 18th, 1928. Group 3 were injected intraperitoneally and group 4 subcutaneously. These 62 guinea-pigs, together with 62 normal controls, were infected May 25th, 1928, by intraperitoneal injection of 1/25th mg. of a virulent bovine strain, *B. tuberculosis* Cockhorn, which had been grown on Petroff's medium for one week. All of the guinea-pigs were bred in this department; they were all white, of the same stock, and of approximately the same age. Three of the controls and seven of the immunised guinea-pigs died of an acute pneumococcal peritonitis within four days after infection. The source of this intercurrent infection was not traced.

The infecting dose used was probably too severe a test to allow of any striking difference between the control and immune animals. Eliminating those which died of pneumococcal peritonitis within four days of receiving the infecting dose of *B. tuberculosis* the average life-time of the controls was 57 days. The average life of the guinea-pigs in groups 3 and 4 was only 50 days. The amount of antigenic substance in the culture used for immunising these animals was very small, and apparently the only result of the treatment was to make them hypersensitive. The average life of the guinea-pigs in groups 1 and 2, however, was 73 days, 28 per cent. longer than the controls. The average life of the group of 14 immunised rabbits was 124 days, while the average life of 14 controls was 81 days. The life of the immune rabbits was therefore 53 per cent. longer than that of the controls. This antigen produced a certain degree of immunity, which was apparent even under the rather severe conditions of the test.

The results of the examination of the blood cultures are recorded in the Tables. The relative numbers of acid-fast bacilli are indicated by one or more signs as follows: (†) indicates very few individual organisms, less than six being found after one hour's search; † indicates individual organisms in larger numbers, and more readily found; †† indicates that clumps and small colonies were found as well as individual bacilli; ††† indicates large numbers of clumps and colonies readily found with the low power of the microscope.

The results of the examination of the blood cultures from all guinea-pigs infected with TB 100, B C G, and TB Cockhorn are summarised in Table V. From this Table it is seen that, as a rule, the average life of guinea-pigs from which positive blood cultures have been obtained, post mortem, is considerably shorter than the average life of guinea-pigs similarly infected which did not give positive cultures. This difference is maintained whether the average life is short, as in Expt. 7, or prolonged as in Expts. 1, 2, and 3. It seems not unlikely that the increased resistance developed during the course of the disease in the longer living animals tends to prevent the bacillæmia, or the growth of the bacilli in the blood culture. This is borne out by the fact that among the immunised guinea-pigs of groups 1 and 2 in Expt. 7, only 70 per cent. gave positive blood cultures, while of the normal controls 93·2 per cent. gave positive blood cultures.

Summary.

From an examination of the experimental data the following facts emerge:—

1. That animals infected subcutaneously, intraperitoneally, or intravenously with *B. tuberculosis*, regardless of the virulence of the strain, have a *B. tuberculosis* bacillæmia in a very high percentage of cases. Of 182 animals, 160 gave positive cultures from the heart blood post mortem—i.e., 87·9 per cent.

2. That from animals whose resistance to infection has been increased by vaccination, a smaller proportion of positive blood cultures is obtained than from normal animals infected at the same time with the same dose of *B. tuberculosis*. Thus in Expt. 7, from 59 control guinea-pigs with an average life of 57 days, 55 positive blood cultures were obtained—i.e., 93·2 per cent. From 30 vaccinated guinea-pigs with an average life of 73 days, 21 positive blood cultures were obtained—i.e., 70 per cent. From a group of 25 guinea-pigs where vaccination resulted only in greater sensitiveness to infection, the average life being 50 days, 24 positive blood cultures were obtained—i.e., 96 per cent. Thus there is an indication that vaccination which produces a higher resistance results in a considerable decrease in the percentage of positive blood cultures.

CONCLUSIONS.

1. A bacillæmia is a regular occurrence in guinea-pigs infected with *B. tuberculosis* of human or bovine type, of high or low virulence. From 152 guinea-pigs, including controls and unsuccessfully vaccinated animals, positive blood cultures were obtained in 91·4 per cent.

2. In any group of animals under similar experimental conditions, infected with the same dose of the same strain of *B. tuberculosis*, positive blood cultures are less frequently obtained from those which live longest, although in these the tuberculous lesions are usually more pronounced.

3. From the experiments detailed, it seems likely that the "chromophobic" (unstainable, or mostly unstainable, and therefore also non acid-fast) tubercle bacilli are of the greatest importance in the development of tuberculosis, experimental or clinical. This is supported by the frequency with which positive blood cultures are obtained when no acid-fast organisms can be detected in direct smears of the blood.

Our thanks are due to Mr. Jesse Wheal and Mr. J. L. Nappin for their painstaking care of the animals during these experiments. One of us (R. L. V.) is greatly indebted to the Medical Research Council for a part-time grant.

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THE DE-AMINISING POWER OF THE BLOOD IN CANCER WITH REGARD TO ARGININE.

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IN 1904 Kossel and Dakin [1] showed that liver tissue possesses an enzyme which they termed arginase and which hydrolyses arginine to ornithine and urea. Clementi (1916, 1918, 1922),[2] Hunter and Dauphinee (1924),[3] and Edlbacher and Rothler (1925),[4] have made a compehensive survey of the natural occurrence of arginase in mammals, birds, and fishes. Edlbacher and Merz (1927)[5] stated that the ferment was absent from most normal tissues save liver, kidney, testis, and placenta, although they have apparently found the enzyme in some species in the red corpuscles.

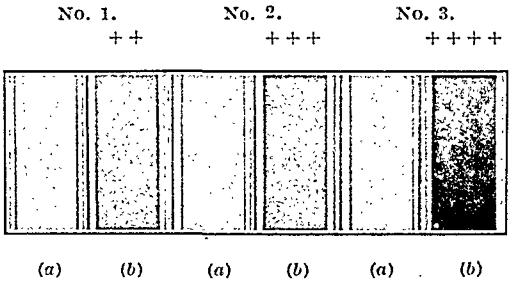
From the Heidelberg laboratory Edlbacher and Merz [5] have recently shown that "all malignant mammalian and human tumours, whether carcinomas or sarcomas, are distinguished from normal tissue by their arginase content." This fact is the more interesting in that there is apparently no sign of a general increase in de-aminising power, other amino-acids not being decomposed. The work recorded in this preliminary report has been an attempt to ascertain whether this metabolic property is reflected in the blood.

Preliminary titrimetric results indicated that if the enzyme is present in the blood in any given case it is, as might be expected, in a concentration very low when compared with that in, say, the mammalian liver or in the tumour tissues examined by Edlbacher and Merz. It has become evident that the positive detection and estimation of arginase under these conditions demands a method of urea determination of great precision. In this work the urease method has been used, followed by indirect nesslerisation.

The preparation of the substance to be examined for arginase varies in the experiments of different workers. Edlbacher and Merz allowed unextracted minced tissue to act directly on an arginine solution, and in the present research blood has been used in the same way.

On the assumption that arginine de-amination if present may be a function of a single element of the blood and that no inhibitory mechanism may reasonably be expected to exist in any other element, in the first instance use has been made of whole blood prevented from clotting by addition to a suitable volume of 2 per cent. sodium citrate in 0·85 per cent. saline. Five c.cm. of fresh citrated blood is accurately measured into each of two sterile test-tubes. To one of these is added 5 c.cm. 1 per cent. arginine in sterile distilled water and to the other an equal volume of the solvent. For the purpose of establishing a series of experiments under these conditions, no account was taken of the resultant pH difference in the tubes at this stage. In practice it has been found that any increase arising from this cause in the blood-urea or ammonia nitrogen in the test specimen as compared with the control is apparently absent or slight. After 1 c.cm. toluol has been added to each tube, these are then stoppered and incubated at 37° C. for a given period, say 24 hours.

—	No colour difference between control and test Nessler,
+	Relative intensification of test Nessler just perceptible.
+ +	Moderate intensification of test Nessler.
+ + +	Very definite intensification of test Nessler.
+ + + +	Strong intensification of test Nessler.



Photographic representations of the colour change in 30 c.cm. of Nessler's reagent, with the value assigned to each. Tube (*a*) in each of the examples represents the control sample, and in these cases was a varying shade of yellow. Tube (*b*) represents the urea in the test sample. In No. 2 it was light amber, and in No. 3 light brown

In the present work use has been made of a sensitive modification of Nessler's reagent containing 7 per cent. final concentration of alkali. The main difficulty encountered is that after completion of aeration the Nessler tubes, while affording an approximate naked-eye comparison, are quite inadequate for accurate colorimetric work on a quantitative scale. This is due to the precipitation of the colloidal coloured ammonia compound formed, and the fault has been investigated and corrected.

Results of Clinical Test.

The conditions examined to date are cases from a general surgical ward, and while the composition of the non-malignant group is not sufficiently varied and does not include examples of the main medical systemic diseases, nevertheless the results obtained so far are sufficient to warrant a preliminary report. The diagnoses were based on clinical, operative, and pathological data, and the results were as shown in the following Table.

The results tabulated may also be stated in the following way. The malignant cases yielded 5 strong results, 13 definite, 7 moderate, 5 weak or doubtful, and 2 negative. The non-malignant cases yielded 18 negative results, 7 weak or doubtful, and 1 moderate. Two cases of doubtful diagnosis as regards malignancy gave a negative and a doubtful result.

The most striking result was that given by Case 5. Clinically this case was remarkable for the extent of the malignant deposits in the cervical glands, and microscopically the tumour was found to possess intense proliferative activity. Case 44 is of interest in that a very definite presumptive indication of the presence of arginase in the blood was obtained before treatment, although clinically the case was definitely regarded as non-malignant. At operation the condition was found to be a carcinoma of the head of the pancreas. A similar instance was found in Case 33, where a positive reaction was obtained. At operation a large gastric ulcer was found with local characters so strongly suggestive of malignancy that arrangements were made for ultimate resection.

Case.	Diagnosis.	Result.
1	Epithelioma of palate c. glandular involvement.	+ + + +
2	Prostatic hypertrophy.	+
3	Squamous epithelioma on old lupus erythematosus.	+ + +
4	Torn lateral meniscus.	—
5	Epithelioma of tonsil with glandular involvement.	+ + + +
6	Prostatic enlargement.	+
7	Epithelioma of lower jaw.	+ +
8	Inguinal hernia.	+
9	Malignant disease of jaw.	+
10	Bilateral hernia.	—
11	Epithelioma of lower jaw.	+ + +
12	Perforated duodenal ulcer.	—
13	Cholecystitis and gall-stones. Adhesions.	—
14	Malignant thyroid.	+ +
15	Carcinoma of pylorus with metastases.	+ + + +
16	Old compound fracture of tibia and fibula.	+ +
17	Rodent ulcer.	+
18	Enlargement of prostate.	+
19	Carcinoma of stomach.	+ + +
20	Acute appendicitis.	—
21	Recurrent dislocation.	—
22	Epithelioma of cheek.	+
23	Torn meniscus.	—
24	Lateral meniscus.	—
25	Epithelioma of palate.	+ + +
26	Scirrhous breast.	+ +
27	Epithelioma tonsil.	+
28	Acute appendicitis.	—
29	Empyema.	+
30	Strangulated hernia.	—
31	Potts' disease and cold abscess.	—
32	Carcinoma of stomach.	+ + + +
33	Pyloric stenosis.	+ + +
34	Ovarian cyst (? papillary adenocarcinoma).	—
35	Carcinoma of stomach.	—
36	Renal colic.	—
37	Recurrence of malignant disease in breast.	+ +
38	Fracture of thoracic vertebræ.	—
39	Appendicitis.	+
40	Recurrent malignant disease of lip.	+ +
41	Chronic appendicitis and visceroptosis.	—
42	Squamous epithelioma of cheek.	+ + +
43	Carcinoma of breast.	+ + +
44	Carcinoma of head of pancreas.	+ + +
45	Carcinoma of rectum.	—
46	Carcinoma of stomach.	+ + +
47	Malignant peritonitis.	+ + +
48	Primary carcinoma of gall-bladder.	+ + + +
49	Carcinoma of tongue.	+ + +
50	Simple goitre.	—
51	Maxillary antrum infection.	—
52	Carcinoma of stomach.	+ + +
53	Appendicitis.	—
54	Hypertrophy of prostate.	+
55	Carcinoma of colon.	+
56	Branchial carcinoma.	+ +
57	Epithelioma of lip.	+ +
58	Carcinoma of stomach.	+ + +
59	Acute appendicitis.	—
60	Duodenal ulcer.	—

Further Inquiry.

The data are inadequate for the determination of the relation to the reaction of the stage of the disease or the results of treatment, but one gains the impression that extensive deposits in the lymphatic glands may lead to a leakage of the ferment into the blood stream as an appreciable trace. Investigation requires to be extended in order to define the precise limits of the reaction regarded as a possible diagnostic aid.

Cases 45–60 have been dealt with by modifications of the method described above. Certain cases have been investigated in an attempt to potentiate the action of any arginase present in the blood. Hunter and Dauphinee showed that pH 7·4 (approximate blood reaction) is about the middle of the range over which arginase shows a rising activity, the optimum being at about pH 9·8. Accordingly, tests were arranged in which the incubation was carried out at this latter level, after which the pH was brought back to 7·4 by the addition of phosphate buffer solution prior to the urea estimation. So far the results of this procedure have been inconclusive. From a few cases in which serum has been used it appears that the ferment if present in whole blood is also present in the serum. With regard to time and the completion of the reaction, it appears that incubation should last for at least 24 hours.

Other cases have been used to endeavour to refine the procedure so as to produce crystal-clear Nessler solutions for accurate colorimetric work. Direct nesslerisation was found to be unsuitable, and the best result so far has been obtained by aerating through a measured volume of $HgI_2.2KI$ solution and making up to a suitable volume by the addition of N/2 NaOH. By this method a test on blood from a malignant case revealed an apparent arginine split of 6 per cent. when examined in a Klett colorimeter. It is also proposed to aerate into a known volume of N/100 H_2SO_4 and utilise this for direct nesslerisation. If by such a method one can arrive at an accurate colorimetric technique, it will greatly facilitate the collection of results on a definite quantitative basis.

I have to acknowledge the encouragement which Prof. T. J. Mackie has given me in the course of this preliminary work, and my thanks are also due to Prof. J. Fraser and Prof. D. P. D. Wilkie for their kindness in giving facilities for the collection of material.

Summary.

(1) A method is described which has been used for the comparison as to urea content of equal volumes of citrated blood incubated under conditions of sterility in admixture with equal volumes of (*a*) 1 per cent. arginine; (*b*) sterile distilled water.

(2) Preliminary results have pointed to the existence of a significant increase in urea concentration when blood from certain cases of malignant disease is incubated under these conditions with arginine.

(3) The presumptive evidence suggests that the effect produced may be attributed to the presence of a trace of arginase in the blood. This suggestion is in no case completely confirmed in so far as the ferment has not been separated from the material examined and destroyed in a control, say by boiling.

(4) The maximum effect has been observed in well advanced cases of malignant disease, particularly in those exhibiting marked involvement of lymphatic glands.

(5) The tentative suggestion is made that a test based on the observation recorded might be utilised for diagnostic purposes.

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MARIE CELESTE SAMARITAN SOCIETY.—This society which was founded in 1791 by Sir William Blizard, surgeon to the London Hospital, exists to supplement the work of the institution; last year it assisted 11,572 patients in various ways. Thus surgical appliances were provided to the number of 4623 at a cost of £5827, towards which patients and their friends paid £2519. The total number of patients sent away to various homes and sanatoriums was 2303, an increase of 372 on the preceding year.

THE SERUM TREATMENT OF LOBAR PNEUMONIA.

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THIS paper records results obtained by treating patients suffering from lobar pneumonia with the polyvalent serum made by the Lister Institute. As soon as the diagnosis was made, and opportunity offered, the patient was given antipneumococcal serum either subcutaneously or intramuscularly. Sometimes two or three doses were given of 25 c.cm. each.

Typing the pneumococcus is not usually a practical proposition when patients are ill in their own homes, and even with full laboratory facilities in a hospital a good deal of time must necessarily be lost before the type is ascertained. It is universally recognised that the sera are generally only useful against type 1 and type 2, but as a very considerable proportion of cases of lobar pneumonia are due to one of these two types, it seems reasonable to give it in the hope that good will result.

Results.

The number of cases treated is not large and of no value for statistical purposes, but the results obtained leave one hopeful that in a considerable proportion of cases of lobar pneumonia the use of antipneumococcal serum may possibly save the patient's life, or at any rate cut short a dangerous and trying illness. Twenty-five cases in all received serum, and 13 of these appeared to derive benefit from it. In the remaining 12 no demonstrable effect was obtained.

Failures.—The cases which were not benefited by the serum are in striking contrast to those that were. Of these 12 patients, three died, one being an alcoholic and likely to die anyway; three developed empyema; four went on until a crisis on the eighth day; one cleared up by lysis about the eighth day, and one had delayed resolution and pneumococcal arthritis. They thus all experienced a long and troublesome illness, possibly with complications, or died.

Successes.—In this group of 13 cases the serum appeared to influence the course of the disease, sometimes in a manner that can only be described as dramatic. Unless one is at the bedside it is not

No.	Sex and age.	Day serum given.	No. of doses.	Day of recovery.	Days in hospital.	Remarks.
1	M., 57	3	3 s.c.	4	—	Severe case; other lung fibroid.
2	M., 40	1	3 i.m.	4	—	Severe case; both lower lobes.
3	M., 37	1	2 s.c.	3	—	—
4	M., 30	2	2 i.m.	3	—	—
5	F., 39	2	1 i.m.	3	12	Severe; resolved four days after effect.
6	M., 38	2	1 i.m.	3	15	Moderately severe.
7	M., 38	2	1 s.c.	3	13	Severe.
8	M., 17	2	1 s.c.	3	15	Fairly severe.
9	F., 14	2	3 i.m.	3	21	Moderate.
10	M., 5	3	3 s.c.	4	9	—
11	M., 6	2	1 s.c.	3	31	—
12	F., 33	5	1 i.m.	6	26	Slow resolution.
13	M., 11	3	2 s.c.	7	16	—

NOTE.—The day given is the day of disease, as far as it could be accurately ascertained. The day of recovery is [illegible] day on which the toxæmia abated and the tem [illegible] Resolution did not necessarily take [illegible] at once. [illegible] muscular injection. s.c. = subc [illegible] possible to show convincingly in every case the good results of serum, but the Table and notes of the cases give an idea of the effects.

CASE 1.—An elderly man, stout and not a good subject; extensive fibrosis being present in the right lung and lobar pneumonia involving the left lower lobe. It seems probable that the serum saved his life.

CASE 2.—Rapid consolidation of the right and left lower lobes appeared in this healthy man, aged 40, and it was evident that the prognosis was hazardous. Toxæmia very severe. The immediate benefit derived from the serum was most striking.

CASE 3.—Man, aged 37. After the second dose of serum there was a crisis on the evening of the third day. A severe toxic case. Left lower lobe affected.

CASE 4.—Left lower lobe affected. Temperature fell after the first dose of serum and reached 99° F. on the evening of the third day after a double dose. Some fever at this level until the seventh day. The course of the disease appeared to be definitely influenced for the better. Patient a man aged 30.

CASE 5.—A severe case. Respirations 36; pulse-rate 110. Immediate effect on toxæmia. Right upper lobe affected. Resolution occurring four days later. Patient a woman aged 37.

CASE 6.—Male, aged 38. Fairly severe toxæmia. Respirations 34; pulse-rate 110. Right lower lobe affected. Rapid improvement after serum. Consolidation never developed. Herpes labialis came later.

CASE 7.—Fairly severe. Definite effect of serum. Left lower lobe affected. Herpes later. Lung cleared on third day. Patient a man aged 38.

CASE 8.—Respirations 40; pulse-rate 130. Left lower lobe. Good effect of serum in 12 hours.

CASE 9.—Very ill. Pulse-rate 120; temp. 105° F. Respirations 38. Right lower lobe affected. Rapid improvement after second dose.

CASE 10.—Right lower lobe affected. Pulse-rate 140; respirations 38. Rapid and obvious improvement after three small doses at short intervals.

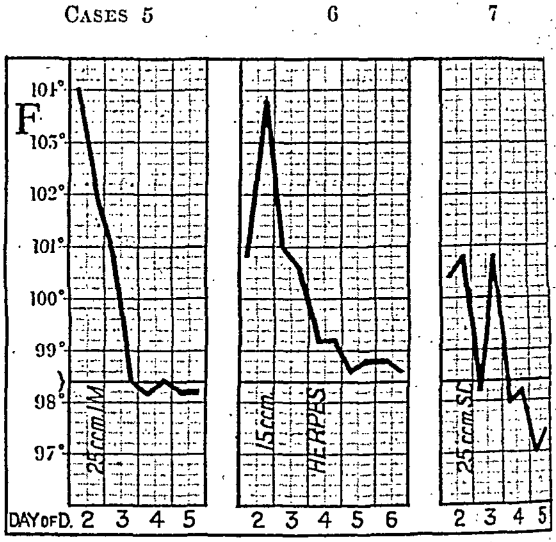
CASE 11.—Vague signs in right lower lobe, but never developed. Pulse-rate 160; respirations 50. Much better the day after serum given.

CASE 12.—Treated rather late. Temperature fell at once after serum was given, and general condition improved. Resolution slow in left lower lobe. In view of this the serum was probably effective, but as it was given rather late the improvement might have been natural.

CASE 13.—Left lower lobe. Moderate case. Possibly doubtful effect, but the patient seemed better after serum.

Comment.

Comparisons.—The incidence of death and grave complications among those patients to whom serum was given, and who were not benefited by it, is fairly high in this small series. As a check upon it is worth while to refer to a series of 14 cases which occurred in hospital before serum was used. Among these 14 cases only one death occurred, and there were no cases of empyema. Two patients had delayed resolution. From this it is evident that consideration of mortality alone, in comparing a series treated with serum with another not so treated, is not necessarily helpful unless the series are very long. One can only go upon a definite change in the course of the disease following the administration of serum, which one would not otherwise have expected. It must also be remembered that in different seasons the character of pneumonia varies, no doubt because of the alteration in the type of pneumococcus prevalent.

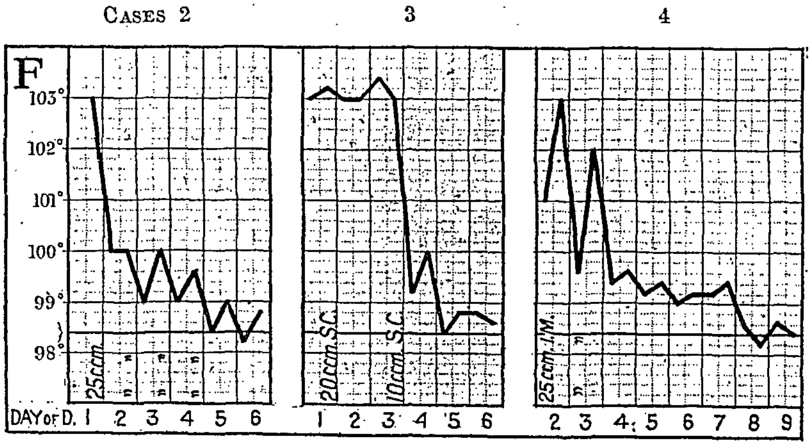


Temperature charts in Cases 5–7.

Good Effects.—Unquestionably the earlier in the disease the serum is given the more complete is the good result, if result is obtained. If one dose has no obvious effect it is worth while to give another or a third. The good effects of the first dose may require to be extended by a further dose. If the temperature has fallen after the first dose, and rises again, a second dose should be given, and so on. The toxæmia is usually controlled quickly in successful cases, and the patient notices the benefit at once. If the consolidation has developed definitely it may take a few days to clear up; but if the serum has been given early, the pneumonic process may subside rapidly and very little consolidation take place.

Ill-effects.—Only one patient had a serum reaction about the tenth day, which was easily controlled by adrenalin. There were no untoward effects apart from this.

Remarks.—From these results it seems reasonable for any practitioner treating a patient for lobar pneumonia to give a polyvalent antipneumococcal serum either intramuscularly or subcutaneously. The technique of intravenous injection is not at the command of everyone,



Temperature charts in Cases 2–4, showing amounts of serum injected (S.C. = subcutaneously and I.M. = intramuscularly). The day of disease is indicated at the bottom of the charts.

and the administration of large doses of serum intravenously is apt to produce reactions which are disturbing. The results suggest that treatment on the lines employed, which are simple, will procure benefit to a certain number of patients suffering from lobar pneumonia; certainly no harm can result even if the case is one which does not respond to serum owing to the infecting organism being of the wrong type of pneumococcus.

Even if a patient is saved two or three days of severe illness something is gained, and convalescence and absence from work are shortened. The anxiety of the patient, his friends, and medical attendant may be greatly diminished. It appears that the serum therapy of lobar pneumonia, whatever form of serum finally turns out to be the best, will give a potent weapon in the treatment of a considerable number of cases of a disease which the medical man has hitherto been so helpless to control.

NOTE ON THE TREATMENT OF CANCER OF THE RECTUM.

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There seems to be a very general belief that the treatment of cancer of the rectum, which is one of the commonest forms of cancer in this country, is very unsatisfactory, and it is even stated by some people that there is no real cure for the condition by modern methods, and that patients would be almost as well off if they were left untreated once they have been found to be suffering from a rectal cancer. This view is, of course, very far from the truth, though, at the present day, over 50 per cent. of the cases brought to the surgeon are already too far advanced for there to be any reasonable chances of a cure.

There are at the present time two chief methods of treating cancer of the rectum which hold out hope of curing the patient. These are by removal of the growth by operation, and by treating it with radium needles or radon seeds. The figures given here relate only to cases of carcinoma of the rectum treated by operation under my own method of perineal excision and operated upon by myself. No cases treated by abdomino-perineal excision are included. This latter operation for the treatment of rectal cancer I now reserve for those cases where it is impossible to remove the growth by the perineal route on account of its height, size, or other causes, and such cases only form a small proportion of the whole. The total number of cases of cancer of the rectum in this series, operated on by the perineal route, is now 300, and very many of them have been traced for periods over five years. No account is taken of cases operated upon less than five years ago, except in estimating the operation mortality. No special selection of cases has been made, and any case in which the growth was removable without exceptional risk was operated upon.

The ages of the patients varied from 29, the youngest, to 79, the oldest. The latter patient is still alive and well, and is now 81. Many of the patients had complicating disease, such as diabetes, Bright's disease, chronic bronchitis, &c.

That cancer of the rectum can be cured by operative treatment is a statement which I think cannot be contraverted after a study of the following table, which shows the number of patients surviving the operation for a period of seven years or more:—

Patients surviving operation 7 years or more ..	56
„ „ „ 10 „ „ ..	28
„ „ „ 15 „ „ ..	5

As cancer of the rectum is a disease of late life, it is obvious that long periods of survival can only occur exceptionally. A large number of patients who have been operated upon have, of course, died of old age and other causes, apart from cancer of the rectum. As a matter of fact, only one case surviving seven years after operation is known to have died of recurrence of the original growth. It is very difficult to know when we are justified in using the word "cure" in relation to any condition, more particularly when it relates to cancer. But there cannot, I think, be any reasonable doubt that the cases in the above table have, with the exception stated, been cured of the disease. Others also who have died of other causes might have been cures had they survived long enough. We generally assume that any case surviving operation five years is cured, but this period is unquestionably rather too short.

Out of 300 private and hospital cases there are 180 who were operated upon more than five years ago. These work out as follows:—

Cures on five-years basis	84
Recurrences	82
Died from other causes during the five years ..	11
Untraced	3

This gives a proportion of 46·6 per cent. cures. Or if we divide the "died from other causes" cases and untraced cases into their probable recurrence-rate—i.e., roughly 50 per cent.—and add 7 cases to the cures, this would make 180 cases with 91 cures, or a percentage of 50·5 cures. In the cases where the operation was performed when the growth was in the early stage before it had gone through the rectal wall, the proportion of cures was 60 per cent.

The actual risks from the operation have now been so much reduced that they are little greater than for operations in general upon persons of advanced age. Thus out of 150 private cases there were six deaths, or a 4 per cent. mortality.

The chances for any individual patient suffering from cancer and who is operated upon in the early stage, while the growth is still limited to the bowel wall, are roughly these: a 96 per cent. chance of surviving the operation and a 60 per cent. chance of being cured from the disease. I think even the most pessimistic person must admit from these figures that cancer of the rectum is by no means an incurable disease. There are, as a matter of fact, a large number of people living useful and active lives who have been cured of rectal cancer as the result of modern surgery, and the proportion of cures would be very much higher were it possible for all cases to be operated on in the early stages of the disease before spread has taken place beyond the muscle coat. The chief handicap to the cure of rectal cancer is not bad treatment, but bad diagnosis of the disease.

It is not possible yet to estimate accurately the chances of a cure from treatment by radium. All we can say at present is that in some cases the growth has entirely disappeared after the treatment by radium, and the patient has remained in perfect health for a period of a year or more. The cases of rectal cancer suitable for radium treatment are those in which the growth is low down and easily accessible; for growths in the middle of the rectum or high up treatment by means of radium is very unsatisfactory, and although good results have been secured in a few such cases, the results in the majority have not been good. Radium is, however, proving of value in delaying or ameliorating growths which are already inoperable, and as the technique of using radium in rectal cancer continues to improve the results will be better. While I am personally doubtful if radium will ever take the place of excision as a means of curing rectal cancer, except in the case of those growths situated at the lower end of the rectum which are easily accessible, I believe that it will prove of great value as an aid to direct surgery in those cases which at present cannot be cured by excision alone.

THE EFFECT OF

GAMMA RAY IRRADIATION UPON THE RED CORPUSCLES.

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Henri and Mayer[1] stated that when radium was allowed to act upon blood corpuscles, partial hæmolysis occurred, which they attributed to "increased osmotic sensitivity." These workers also found that a suspension of hæmoglobin became converted into methæmoglobin.

Working here in connexion with radium, more particularly with the National Radium Commission's 4-gramme "bomb," we observed that if a series of blood counts be performed during the patient's "bomb" treatment, the fall in the red corpuscular count is more marked than the fall in the hæmoglobin percentage. This led me to experiment to see whether increased osmotic sensitivity of the red corpuscles were measurable in vitro.

Ten samples of blood were obtained from patients, only four of whom were suffering from malignant disease. The technique was standardised so that 10 c.cm. of blood from each case was put into a tube containing 50 mg. of neutral potassium oxalate. This salt was present as a fine coating on the walls of the tube after the technique of Beaumont and Dodds,[2] who introduce a solution of the salt and drive off the water in an oven. The bloods, after vigorous shaking, were divided into equal parts, one being exposed at a distance of 1·5 cm. for a period of 48 hours to the "bomb"; the second portion was kept as a control. The fragility was then measured by the sodium chloride method and the readings taken at the end of an hour.[3]

Table I. explains the technique and Table II. shows the results obtained. A standard Dreyer pipette was used throughout.

TABLE I.

Number of drops of 1 per cent. NaCl in distilled water..	7	6	5	4	3	2	1
Number of drops of distilled water	3	4	5	6	7	8	9
Resulting dilution per cent.	0·7	0·6	0·5	0·4	0·3	0·2	0·1

It can be seen that in every one of these cases, a definite increase in fragility has been demonstrated. This finding naturally resulted in further investigations with a view to establishing the cause. Two explanations are open: (*a*) That there is some change produced in the plasma so that its osmotic effects are strengthened and the red corpuscles weakened secondarily. (*b*) That the red corpuscles are altered in some way so that the *normal* plasma osmotic tension has a much increased effect. Finally, the possibility of a combination of these must be considered.

With these queries in mind I irradiated, in the same manner as before, washed red corpuscles in saline suspensions, and the separated plasma. Controls were kept and used as previously. The irradiated corpuscles have been shown repeatedly to be *more* sensitive—e.g., irradiated corpuscles 0·4 + + +, control corpuscles 0·35 + + +. On the other hand, no change has been detectable in the plasma, when varying dilutions of irradiated and control plasma have been added to unirradiated corpuscles and the hæmolysis point determined. This further observation appears to demonstrate that the effects of irradiation fall directly on the red corpuscles and the problem then resolves itself into considering whether the change is on the corpuscular "limiting membrane" or upon their contents.

TABLE II.

Blood of case.	Irradiated.		Control.	
1	0·3 + + +	0·4 + +	0·2 + + +	0·3 + +
2	0·5 + + +		0·4 + + +	0·5 + +
3	0·5 + + +		0·4 + + +	0·5 +
4	0·3 + + +	0·4 + +	0·3 + + +	0·4 +
5	0·4 + + +	0·5 +	0·3 + + +	0·4 + +
6	0·4 + + +	0·5 + +	0·3 + + +	0·4 + +
7	0·4 + + +	0·5 + +	0·3 + + +	0·4 +
8	0·4 + + +	0·5 + +	0·3 + + +	0·4 +
9	0·4 + + +	0·5 + +	0·3 + + +	
10	0·4 + + +		0·3 + + +	0·4 +

+ = Commencing hæmolysis. + + = Partial hæmolysis.
+ + + = Complete hæmolysis. Figures = per cent. saline.

Hæmolysis in a higher strength saline indicates increased fragility.

Now a red blood corpuscle is a relatively inert and non-nucleated body acting physico-chemically as a carrier. First Bohn,[4] subsequently Hertwig,[5] then Mottram,[6] and later, French workers[7] have shown that a cell is most radiosensitive during mitosis; from this it has been assumed that the effects of irradiation fall mainly upon the nucleus when it is in the later phases of mitosis. This period must also be the time when the cell membrane is weakest, as it is then compelled to enlarge its area to enclose the newly forming cells.

In order to provide one explanation for radiosensitiveness of non-nucleated red corpuscles and nucleated cells, I venture to suggest that in both instances irradiation modifies the limiting membrane so that its osmotic selectivity is impaired, and further, that the nuclear phenomena, which have been described by several observers, are in fact secondary changes. Some added weight is given to this theory by the work of Schwarz,[8] who demonstrated that skin, rendered anæmic by pressure, gave a subnormal reaction to irradiation. This suggests that whatever change may occur in the cells, the fullest results only appear in the presence of a free blood-supply. This latter is emphasised by the work of Jolly,[9] who found that a rabbit's popliteal gland was radioresistant following partial curtailment of its blood-supply.

In conclusion, I wish to acknowledge the assistance of Dr. F. D. M. Hocking, who has checked and confirmed my observations.

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CLINICAL AND LABORATORY NOTES

PAPILLŒDEMA AND OPTIC ATROPHY FOLLOWING INTESTINAL HÆMORRHAGE.*

BY I. J. FRANKLEN-EVANS, M.B. CAMB.

PAPILLŒDEMA and optic atrophy following hæmorrhage is rare, only 240 cases having been reported in the literature up to 1924 (Harbridge),[1] and comparatively few of these cases have been observed from the onset of the papillœdema.

The two cases recorded developed papillœdema while in hospital. In Case 1 papillœdema was discovered during a routine examination; but although marked secondary optic atrophy supervened, there was no loss of visual acuity whatsoever. Cases previously reported have all begun with sudden loss of visual acuity and there has been marked permanent impairment of sight. A careful search of the London Hospital records back to 1900 yielded only two additional cases of optic atrophy following hæmorrhage; in both cases there was a history of a severe hæmatemesis and sudden loss of sight.

CASE 1.— A boy, aged 17, was admitted to the London Hospital on Feb. 10th, 1928, with a three weeks' history of epigastric pain relieved by vomiting, but there was no hæmatemesis. He had been constipated for three weeks, but there was no melæna. During the next four days he passed dark stools, suffered from diarrhœa, and became very anæmic. A blood count on Feb. 15th showed: erythrocytes, 3,300,000 per c.mm.; hæmoglobin, 46 per cent.; colour-index, 0·7; leucocytes, 4880 per c.mm.; polynuclear neutrophils, 69 per cent.; polynuclear eosinophils, 1 per cent.; small lymphocytes, 25 per cent.; large lymphocytes, 1 per cent.; large hyaline cells, 4 per cent. Anisocytosis and polychromatophilia were present. The patient was given a blood transfusion. On March 1st a widespread œdema of the optic nerve and retina was noted and a week later both right and left eyes showed papillœdema with three dioptres of swelling, and hæmorrhages were present in both eyes. A blood count showed: erythrocytes, 2,200,000 per c.mm.; hæmoglobin, 25 per cent.; colour-index, 0·57; leucocytes, 6400 per c.mm.; blood-platelets, 270,000 per c.mm. The chest, abdomen, and central nervous system were normal; the tonsils were enlarged and pale. He complained of no disturbance of vision.

There was a slight irregular pyrexia; the urine was clear: the Widal test was negative. An X ray report on March 29th stated that a small penetrating ulcer was present on the lesser curvature of the stomach. Before admission to hospital he had taken no medicine except some castor oil; he did not drink, and smoked about ten cigarettes a day.

The patient was first seen by me on August 25th, 1930. He had been perfectly well since he was in the London Hospital in 1928 and had had no trouble with his eyesight. In the right eye, vision was 6/6 and marked secondary optic atrophy was present, with sheathing of the vessels on the disc. The physiological cup was filled. Examination on this day showed in the left eye, vision was 6/6 and some sheathing of the vessels on the disc was present, with indistinctness of the margin up and in. The physiological cup was filled. There was no scotoma or constriction of the visual fields. The central nervous system showed no other abnormality.

CASE 2.—A boy, aged 16, was admitted to the London Hospital on July 28th, 1928, in a pale and shocked condition, having had four profuse hæmorrhages from the rectum in the last 24 hours. An examination was negative except that the liver was enlarged 1 in. below the costal margin. A blood count showed: erythrocytes, 2,600,000 per c.mm.; hæmoglobin, 35 per cent.; colour-index, 0·67; leucocytes, 6240 per c.mm.; polynuclear neutrophils, 61 per cent.; small lymphocytes, 20 per cent.; large lymphocytes, 1·5 per cent.; large hyaline cells, 7·5 per cent. Poikilocytosis and anisocytosis were present.

Two days later the boy complained of a headache which was still present on August 2nd. The pulse-rate gradually rose from 100 on July 29th to 120–128 on July 31st, and then remained between 112 and 120. A large stool containing blood was passed, and on August 3rd a blood count showed: erythrocytes, 1,300,000 per c.mm.; hæmoglobin, 20 per cent.; colour index, 0·8. A transfusion of 17 oz. of blood was given, with immediate improvement in the patient's condition. The improvement was maintained, although he passed about 10 oz. of tar-like blood.

On August 7th he complained of not being able to see properly, and screwed up his eyes. On examination there was loss of the lower half of the left visual field. The liver was not palpable. The chest and central nervous system were clear. Ophthalmoscopic examination showed papillœdema with yellowish patches in both fundi. A blood count on the same day showed: erythrocytes, 2,200,000 per c.mm.; hæmoglobin, 33 per cent.; colour-index, 0·75; leucocytes, 3720 per c.mm. On August 16th a blood count showed: erythrocytes, 2,500,000 per c.mm.; hæmoglobin, 29 per cent.; colour-index, 0·58. The papillœdema was increasing and in the left eye papillœdema, hæmorrhages, and exudate were present. The macula was unaffected. In the right eye similar changes were present. A blood transfusion of 17 oz. was given, and the next day a blood count showed: erythrocytes, 2,600,000 per c.mm.; hæmoglobin, 34 per cent.; colour-index, 0·65. On August 28th papillœdema was more marked in the left eye and half a dozen small yellowish "chicken-down" patches were present just above the left disc. A blood count showed: erythrocytes, 3,400,000 per c.mm.; hæmoglobin, 42 per cent.; colour-index, 0·62; leucocytes, 5000 per c.mm.

On Sept. 9th he complained of headache, chiefly over the left eye, and an ophthalmoscopic examination of the left eye showed papillœdema and yellowish spots of exudate. The field of vision was as before—i.e., loss of the lower and outer part of the left field. A blood count showed: erythrocytes, 3,700,000 per c.mm.; hæmoglobin, 47 per cent.; colour-index, 0·64; leucocytes, 6400 per c.mm. There was a little irregular fever the whole time he was in hospital and the pulse remained between 80 and 90. The urine contained a trace of albumin and there was a deposit of a few leucocytes, epithelial cells, and uric acid crystals.

Previously he had always enjoyed excellent health and a good appetite, and had not suffered from indigestion or diarrhœa. He had had diphtheria. He smoked about five to ten cigarettes a week. He had taken no medicine of any description before admission to hospital. Several members of the family suffer from severe epistaxis.

The patient was treated with liver juice daily and injections of collosal iron twice weekly. He was seen on Sept. 22nd, 1930. He had been in good health except for occasional attacks of neuralgic pain over the occipital region which lasted for about 48 hours. The first attack occurred about ten days after he lost the sight of his left eye. As far as he could tell, his vision had neither improved nor deteriorated. An examination of the central nervous system showed no abnormality, except that the left pupil was slightly larger than the right. Both fundi showed secondary optic atrophy, more marked in the left eye than in the right. A perimetric examination showed loss of the lower half of the left field, with marked constriction of the upper half, most marked in the outer quadrant. The right visual field was full, except for some loss of the nasal portion of the field. A blood count showed: erythrocytes, 5,800,000 per c.mm.; hæmoglobin, 92 per cent.; colour-index, 0·87; leucocytes, 5200.

Blindness hardly ever follows immediately on the hæmorrhage but usually comes on two to three days later, though never at a greater interval than three weeks (Terson[2]). The source of the hæmorrhage is varied, about 70 per cent. being from the uterus or gastro-intestinal tract. Blindness extremely rarely results from traumatic hæmorrhage. Goulden, Whiting, and Foster Moore[3] saw no case in the late war, although one case was reported by Terrien[4] in a soldier with gas gangrene. He suggests that the ganglion cells by a previous toxæmia have been rendered incapable of surviving a serious loss of blood.

Zentmayer[5] found that in 88 per cent. of cases both eyes are affected, and that in these bilateral cases 59 per cent. are totally blind. The commonest visual field defect is a loss of the lower part (23 per cent.) or a peripheral constriction (21 per cent.), marked contraction of the nasal field being rare (3·7 per cent.).

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* Being part of a thesis written for the degree of M.B. at the University of Cambridge.

The most rational line of treatment would seem to be a blood transfusion, and Darrier[6] recommends transfusion, massage to decrease the intra-ocular tension, and in some cases paracentesis.

The ophthalmoscopic observations in these two cases were made by Mr. Charles Goulden, senior ophthalmic surgeon to the hospital, to whom my thanks are due for permission to publish the results. I also wish to express my thanks to Mr. Robert Milne for permission to publish Case 1 and to Prof. Arthur Ellis for Case 2.

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ARTIFICIAL PNEUMOTHORAX.

SOME RESULTS OF OUT-PATIENT TREATMENT.

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MEDICAL REGISTRAR, VICTORIA PARK CHEST HOSPITAL, AND CASUALTY PHYSICIAN, ST. BARTHOLOMEW'S HOSPITAL.

The following report deals with 26 cases of pulmonary tuberculosis treated by artificial pneumothorax during 1930 at the City of London Hospital for Diseases of the Chest, Victoria Park. The cases came, in the first instance, from sources other than the hospital itself, and the treatment was therefore a continuation of the artificial pneumothoraces instituted elsewhere. Patients only recently attending have not been included in this series. The smallness of the number does not, of course, permit of any far-reaching conclusions, but the progress of the patients seems to us to justify publication and to emphasise once more the great value of artificial pneumothorax as an adjunct to treatment in suitably chosen cases of pulmonary tuberculosis.

In taking charge of cases of artificial pneumothorax, it very soon becomes clear that the mechanical refill is only a small part of the duty involved. Each visit calls for a careful survey for changes of any kind, in symptoms, weight, temperature, or physical signs, and for consideration of the latter in conjunction with X ray findings. Frequent screening and photographs, as may be deemed necessary—preferably at not more than three-monthly intervals—are essential for keeping pace with the progress of the case and controlling the degree of collapse, especially if effusion occurs. Sputum, when present, must be recorded and examined at intervals for tubercle bacilli, and final pressures, length of intervals between refills, and the continuance of the treatment must be constantly revised.

Family history of phthisis was definite in nine cases, but negative or unknown in 17. This is not surprising, considering that patients refer only to very close relations and have, as a rule, no knowledge of other possible sources of infection during childhood.

Progress and prognosis.—Sixteen are doing well, five are doubtful (of these one is fit for work while four have a poor prognosis), and one has died. Seventeen are fit to work as against eight who are not. Special attention is drawn to these figures, which seem to us to justify a degree of optimism which could not previously have been entertained. In the majority of the cases the original occupation has been resumed. Eighteen cases have no tubercle bacilli in the sputum, while eight retain them.

Pleural effusion occurred in ten cases, in eight being serous and in two purulent; in both the latter the effusion contained large numbers of tubercle bacilli. The occurrence of a serous effusion, though calling for added care and scrutiny, does not greatly increase the difficulties of the case or adversely affect the prognosis. Purulent effusions, on the other hand, are always serious complications and involve the admission of the patient to hospital for appropriate special treatment.

Twelve cases were admitted to the wards of the hospital for special causes, of which the treatment of adhesions was the chief. Pleural adhesions are a definite handicap in pneumothorax treatment, and if accessible and suitable for division should be dealt with by thoracoscopy and electrical cautery whenever their presence is preventing a satisfactory functional collapse of the diseased lung.

The following is the analysis of our 26 cases.

Total cases, 26: male, 12; female, 14.
Family history: positive, 9; negative or not known, 17.
Lung involved: right A.P., 12; left A.P., 13; bilateral A.P., 1.
Prognosis: doing well, 16; doubtful, 5; poor, 4; died, 1.
Working or fit to work: 17.
Unfit to work: 8.
Weight: gain, 11; stationary, 8; lost, 7.
Sputum: positive, 8; negative, 18.
Condition of other lung: healthy, 17; diseased, 9.
Effusions: serous, 8 (in one case air replaced three times); purulent, 2.
Adhesions: operated on, 7; not operated on, 12.
Admitted to hospital or sanatorium: 12.
Pneumothorax discontinued: 6.
Average duration to end of 1930: 27 months.
Intervals: 1 week, 1; 2 weeks, 9; 3 weeks, 12; 4 weeks, 2; 5 weeks, 2.

In justification of our cheerful prognosis, we point to the fact that 16 patients are entirely free from malaise; sputum is either absent or free from tubercle bacilli; the second lung is healthy; the weight is steady or increasing, and all are either at work or trying to get regular employment, which is itself an additional factor in maintaining and improving mental and physical well-being.

Queen's Institute of District Nursing.—According to the report for 1930, during the last 20 years the number of nurses working in connexion with the institute has more than doubled, and the total number of nurses now working in England, Scotland, Ireland, and Wales is nearly 7000. The number of nursing associations affiliated to the institute is 1503. Each year the nurses attend approximately 680,000 cases and pay 16,320,000 visits. Under the National Gardens Scheme 901 gardens were last year opened to the public, and the £10,119 thus raised was an increase of £2354. The Queen's Institute is now to receive 40 and the nursing associations 60 per cent. of the proceeds of the garden scheme.

National Hospital for Diseases of the Nervous System.—The board hope that sufficient benefactions will shortly be received to justify the issue of an appeal for £75,000 to clear the cost of the proposed new pathological department, surgical ward, and home for male nurses. Last year the total number of in-patients was 1541, and the cost of maintenance £41,912, an increase of more than £1400; the expenditure exceeded the income by £6155. The average weekly cost per occupied bed at the hospital was £3 7*s.* 11*d.*, and at the convalescent home £1 18*s.* 2*d.* In the medical school there were last year 394 men and women students. Applicants for training in the school of massage are so numerous that the commencing classes of the course are often filled six or even twelve months before the opening of the term.

MEDICAL SOCIETIES

CONGRESS OF OBSTETRICS AND GYNÆCOLOGY.

GLASGOW, APRIL 22ND–24TH.

THE eighth British Congress of Obstetrics and Gynæcology was opened in the Lister Memorial Hall, Royal Infirmary, Glasgow, on April 22nd, under the presidency of Dr. DAVID SHANNON. After welcoming the delegates the President called upon Prof. BLAIR BELL (Liverpool) to open a discussion on the

Clinical and Pathological Features of Ovarian Tumours (Excluding Endometriomata).

After referring to the untimely death of Prof. John H. Teacher, who was to have taken part in this discussion, Prof. Bell said that, as it was impossible for him to cover the whole ground, he would deal with those parts of the subject of which our knowledge was imperfect or absent. Existing classifications of neoplasms, he said, were founded on histological, embryological, or regional bases; for ovarian neoplasms this was not entirely satisfactory. A perfect classification should be one that could be used as the starting-point of any comprehensive survey. First a distinction must be made between tumours of intrinsic and those of extrinsic origin. The former of course comprised the largest group, and consisted of neoplasms which arose from the normal integral tissues of the ovary. These tissues might be subdivided into those which are essential to the function of the ovary and those which consist of developmental relics. The extrinsic group contained new growths having their origin in developmental inclusions, invasions from without, malignant extensions, and metastases. This classification, which he gave in detail, did not, he said, illustrate the development of malignancy in a previously innocent neoplasm—a phenomenon well known, especially in connexion with lepidic new growths. The word "lepidic" was Adami's term for tumours consisting of epithelial, mesothelial, or hypothelial elements; it was, he remarked, convenient and scientifically accurate. He went on to discuss the relative frequency of the different neoplasms of the ovary. Macroscopical appearances were of importance to the operator who often had to decide on inspection whether a tumour was innocent or malignant.

Prof. Bell then dealt with some of the rarer intrinsic neoplasms, innocent and malignant. Folliculomata, he said, were of exceptional interest at the present time. He did not believe that ova were formed anew in this growth, but agreed with R. Meyer that the ovule-like areas were small lacunæ of liquor folliculi, produced by the granulosa cells of which the tumour consists. It was interesting to surmise on the evidence of uterine hypertrophy and bleeding that œstrin may be formed in excess by granulosa-cell neoplasms (folliculomata). He discussed at length so-called border-line papillary neoplasm; for himself he held that there was no such thing. Papillary tumours were either innocent, although they might give rise to local implantation (which was not a malignant phenomenon), or they were malignant. The phenomena that led to doubt were due to such conditions as "compaction" of the papillæ and to malignancy developing in small areas of the growth. Careful examination of a number of sections enabled a decision to be reached. Malignant neoplasms other than those mentioned were either: (*a*) primary tumours of intrinsic origin; carcinoma, sarcoma, or mixed; (*b*) primary malignant neoplasms arising in tissues of innocent neoplasms—namely, in cystadenomata, papillary cysts or dermoids; (*c*) secondary neoplasms of extrinsic origin, the result of metastasis; (*d*) secondary neoplasms of the ovaries by direct invasion. Grafted ovarian neoplasms in the ovary of the rabbit were shown. Examinations had been made of the fluid from the various types of cysts. No new observations were recorded, but much of interest had been noted, especially the fact that malignant cysts may contain mucin instead of pseudomucin.

Turning to clinical considerations Prof. Bell said that the relation of age, parity, and other points in the histories of the patients, and also the frequency of unilateral and bilateral neoplasms were worthy of note. In *diagnosis* difficulty arose most commonly in respect of bilateral tumours of a solid or papillary nature, especially as free fluid was often associated with both the innocent and malignant. The points to be considered were: the presence or absence of a primary malignant growth, masses in the liver, occurrence of adhesions, age, and general condition of the patient. Ascites depended on whether the tumour was sufficiently free and out of the pelvis to irritate the peritoneum, or whether there were implantations in the general peritoneal cavity. Cases were quoted to illustrate the many difficulties and pitfalls that may be encountered. The only *treatment* considered was surgical. Innocent tumours required removal, but an effort should always be made to conserve some normal ovarian tissue. In malignant ovarian disease X rays and radium appeared to do more harm than good. Chemotherapy with lead might be very useful, but in these circumstances it was usually combined with surgery. If the tumour rose above the pelvic brim laparotomy was advised by Prof. Bell, but attention was drawn to the advantage of the vaginal route, during pregnancy, for removing cysts in the true pelvis. Long incisions were favoured for the larger cystadenoma in people of middle age, owing to the possibility of malignant disease and adhesions, which were more easily separated if the cyst was untapped. The danger of adhesions to malignant neoplasms was worthy of attention. It was essential to remove both adnexa and fundus uteri in all doubtful and malignant cases even if the growth appeared localised to one side; this procedure should be practised in every case after the menopause.

Prof. Bell's remarks were illustrated by many lantern slides.

CLINICAL ASPECT.

Prof. BECKWITH WHITEHOUSE (Birmingham) said that during the last 25 years British gynæcologists had made several important contributions to our clinical knowledge of ovarian neoplasms; he quoted from A. Donald, Munro Kerr, J. W. Bride, and Green-Armytage. The operations narrated in the various papers together with the speaker's own 200 made a total of 1349. He analysed his 200 cases on the basis of Bride's investigations of a series of 100 similar neoplasms published in 1930. He grouped the results into eight tables showing the pathological type of neoplasm, age-incidence, fertility, symptoms (benign neoplasms), symptoms (malignant neoplasms), mortality of operations, surgical treatment employed, and finally the complications. Little was to be learned, he said, of the nature of tumours by correlating the symptoms and physical signs; from the practical point of view the most useful classification was the simple division into benign and malignant types. The average age-incidence was 42, the youngest 16, the oldest 74. Seventy per cent. of the material came from the age-group 30–60 years. He drew attention to the higher rate of mortality attaching to operations for ovarian tumours as compared with hysterectomy for fibroids, and pointed out possible causes for the difference, among which were the separation of adhesions with the large raw surface exposed, and the greater risk of opening the bowel and infecting the peritoneum. Reviewing the various forms of treatment, he emphasised the value of oöphorectomy in advanced malignant disease of the ovary. He had two cases alive now that had been treated with colloidal lead after double oöphorectomy, and in whom at the time of operation the prognosis appeared quite hopeless.

PATHOLOGICAL ASPECT.

Mr. T. G. **Stevens** (London) remarked that germinal epithelium is in no sense true epithelium and therefore an unlikely source of these tumours. He suggested the origin of epithelial neoplasms from traces of the primitive tubular ovary, pseudomucin being the normal secretion of this persisting tubular system. He did not believe that folliculoma or granulosa-cell cancer existed; the new formation of ova described by continental writers seemed to him contrary to all physiological and developmental principles. Ova are present in the ovaries at birth and no new ones are ever formed. Mr. Stevens considered that all these tumours were endotheliomata which might exist as benign or malignant neoplasms. He thought that innocent tumours of the ovaries never became malignant. In conclusion, he described the pathological changes which follow upon torsion, infection, and rupture of ovarian cysts, stating that when a pseudomucinous cyst ruptures it always leads to pseudomyxoma peritonei.

SURVEY OF CASES.

Mr. C. D. **Lochrane** (Derbyshire) read a paper by Mr. G. F. **Keatinge** (Derbyshire) and himself, surveying 180 consecutive cases of ovarian neoplasm. He classified these tumours into solid and cystic, further subdividing the latter into unilocular or multilocular cystadenomata and cystic teratoma. The solid are classified as innocent, malignant, or doubtful. Ascites was present in 73 per cent. of all the patients who had solid and semi-solid growths, in 28 per cent. of the benign solid tumours, and in 14 per cent. of the cystadenomata. Torsion of the pedicle occurred in 10 per cent. of all tumours. He considered the incidence of adhesions, of hæmorrhage in the tumours, of the occurrence of suppuration, and of the association of pregnancy. He described several interesting cases and a follow-up of the cases of solid and cystic malignant tumours which had been submitted to radical extirpation.

Dr. S. J. **Cameron** (Glasgow) analysed 150 cases of cancer and 19 cases of sarcoma in relation to age-incidence, presence of pain, abdominal swelling, loss of weight, period of ill-health, occurrence of uterine hæmorrhage, digestive disturbances, difficulty in defæcation, dyspnœa, vaginal discharge, pigmentation, ascites, adhesions, secondary growths, pelvic infection, rupture of the cyst and torsion of the pedicle, pyrexia, phlebitis, glandular involvement, absence of symptoms, removal of the tumour, and parity. He advocated removal of malignant ovarian neoplasms whenever possible even though the growth was advanced and clinically inoperable, as this often gave the patient a much more comfortable end. Referring to expectation of life, he had found that young patients and the old succumbed more quickly than women in middle life. He described a clinical picture which he thought should clinch the diagnosis of malignancy when this was in doubt.

Sir **Ewen J. Maclean** (Cardiff) was in the chair during the afternoon session when Dr. D. **McIntyre** (Glasgow) read a paper dealing with malignancy in ovarian tumours. He analysed 160 cases, all of whom had a reliable history and a microscopic section; 63 were malignant and 81 benign, the rest being doubtful. The relationship of age, marriage, parity, and other factors of the malignant tumours were compared with those of the benign growths. Tables were shown giving the follow-up records after five years (average) in 123 available cases, these results being examined alongside tumour types. He discussed the difficulty of classifying ovarian tumours and in arriving at a decision regarding malignancy in a proportion of cases with lantern slide illustrations. Sections of three granulosa-cell tumours were shown, with the effect of these neoplasms upon the endometrium; also a case of suspected luteinoma. Bilateral tumours were, he said, more frequent in multiparæ.

Dr. J. **Gardner** (Glasgow) read a paper on the clinical features of benign ovarian tumours, his material consisting of 300 innocent neoplasms. Many of his findings were in agreement with what had been said by previous speakers. While it was true that the uncomplicated ovarian tumour might be symptomless, he had found symptoms in a great majority. In 40 per cent. of the cases there were complications of some moment; of these, torsion was the most frequent, not confined to tumours of moderate dimensions. Menstrual disturbances were not of sufficient uniformity or frequency to have any significance. Solid tumours constituted 4 per cent. of the total.

DISCUSSION.

Prof. H. **Guggisberg** (Berne) discussed the pathogenesis of ovarian tumours. Folliculomata he held to arise from Graafian follicle epithelium. In two cases he had seen the uterus was enlarged to twice the normal size, but returned to normal when the tumours were extirpated. With reference to secondary carcinoma, he felt sure that malignant change could occur in pre-existing innocent tumours. Clinical signs were much to be relied upon. He had also experienced the high operative mortality described by other speakers and attributed it to the fact that many of the patients in Switzerland did not seek treatment until their tumours had reached an enormous size. He advocated the use of X rays for the treatment of ovarian tumours of certain types.

Prof. **Munro Kerr** (Glasgow) referred mainly to the surgery of ovarian tumours. The relatively high mortality of ovariotomy as compared with hysterectomy was outstanding. He thought that the uterus should always be removed if malignancy was suspected. In a difficult case the operation should be commenced on the easy side and then the more difficult could be approached from below; in this way damage to the ureter was often avoided.

Prof. **Louise McIlroy** (London) referred to the developmental anatomy. She did not think that ova could be developed anew in malignant tumours. She thought also that many of the solid ovarian tumours were endotheliomata. Whenever it was possible she advocated leaving a portion of ovary in situ. She could not help feeling that there must be some more intimate connexion between the breast and the ovaries than merely that of the lymphatics or blood stream to account for their frequent involvement by secondary growths.

Prof. R. J. JOHNSTONE (Belfast) said he had seen ovarian cysts rupture as the result of violence. He referred to two patients in whom torsion of the pedicle of an ovarian tumour had completely separated the neoplasm from its attachments. He considered that multilocular ovarian tumours might have an effect on menstruation such as prolonging the onset of the menopause and even causing menorrhagia. His operation results showed six deaths out of 130 ovariotomies. The fact that one of his patients died as soon as he had eventrated a large tumour made him lean towards puncturing all cysts in patients with feeble circulations to prevent shock.

Prof. GREEN-ARMYTAGE (India) said that in his practice the high operative mortality was due to the large size of the cysts dealt with. His series also showed a large number of broad ligament cysts. In a number of the cases it had been necessary to remove both ovaries and the uterus for broad ligament cysts.

Dr. LEITH MURRAY (Liverpool) agreed with Mr. Stevens as regards ovarian carcinoma not developing in innocent neoplasms. He believed that pseudomucinous and also papillomatous cysts remained innocent. He referred to recurrence after operations, rupture of cysts, and the incidence of suppuration of which he had only seen one case.

Dr. CANTOR (Pennsylvania) referred to granulosa-cell tumours, quoting the work of Robert Meyer. These tumours were very seldom bilateral; the symptoms disappeared upon removal of the tumours with a return to normal of the uterus. Out of a series of 33 cases collected by Meyer 19 were alive and well over three years after operation.

Dr. BETHEL SOLOMONS (Dublin) wished to obtain information about the treatment of residual portions of ovarian carcinoma following surgical intervention. He had utilised several methods but had not met with much success. X rays, he thought, were detrimental. Pseudomyxoma peritonei he considered malignant.

REPLY.

Mr. STEVENS said he did not agree that hysterectomy was necessary with bilateral ovarian tumours if the uterus was normal, as recurrence never occurred in this situation.

Prof. WHITEHOUSE said he had utilised various forms of treatment for residual masses and recurrence after incomplete operations for malignant ovaries. Radium and X rays were disappointing.

Prof. BELL pointed out the possibility of differentiating between bilateral ovarian fibromata and sarcoma at operation. Referring to Prof. Whitehouse's remarks, he said he had never experienced difficulty in resecting portions of ovary. With regard to the operation mortality-rate he was a believer in spinal anæsthesia for weakly and elderly subjects. As to the question of the route whereby secondary tumours reached the ovaries from primary gastric and mammary carcinoma, he remarked that in transplantable carcinoma of the rabbit it had been found that the growth proceeded to the lowest part—i.e., the diaphragm. Mr. Stevens, he added, had produced no pathological material to substantiate his statements; he (the speaker) had satisfied himself that malignant change occurred in innocent neoplasms. He recognised the essential differences between folliculomata and endotheliomata of the ovary.

Teaching of Obstetrics.

On the second day Dr. H. S. DAVIDSON (Edinburgh) was in the chair during the morning session, when the President read Prof. S. A. GAMMELTOFT's paper on the teaching of obstetrics and gynæcology, and the methods employed in Copenhagen. He dealt with maternal mortality and the desire to reduce the infantile death-rate. In the past antenatal care had been regarded as the way to combat maternal and child mortality. Now improved instruction of students in midwifery seemed to be the keynote. The medical course which extended over seven and a half years in the University of Copenhagen was outlined. He did not set much importance on theoretical lectures but believed rather in giving the students practical demonstrations; most of their time should be spent with patients; discussions between students and teachers were valuable. Puerperal care of the mother and child were demonstrated practically in the wards by the nursing staff. One of the deficiencies of his school was that attendance at antenatal clinics was not compulsory. On qualifying the student must take a practical obstetrical course for one month before he was allowed to attend labour cases. The post-graduate teaching was conducted by Prof. Gammeltoft and his assistants, the chief midwife also taking an active part in supervising the work. Abdominal examination was mostly utilised. Finally, the accommodation for deliveries and operative treatment was discussed.

DISCUSSION.

Prof. GUGGISBERG outlined the curriculum of his school where most time was given up to the teaching of midwifery, as Swiss practitioners, owing to transport difficulties, had to deal with all emergencies as they arose. Great stress should be laid on the biology and pathology of pregnancy and the puerperium. He was a strong exponent of rectal examination.

Prof. WHITEHOUSE considered that in this country too much time was given to the teaching of gynæcology. He agreed with Prof. Gammeltoft's remarks as to the ideal to be aimed at. He now employed films to illustrate abnormalities of labour to his students.

Dr. J. S. FAIRBAIRN (London) agreed with the previous speakers but pointed out that every teacher had his own methods. He believed that students should for a time live in an atmosphere of obstetrics. He supported those who utilised their midwives as teachers. He taught non-interference, and the desirability of encouraging physiology to take its course.

Prof. KERR said that there was no minor surgery in obstetrics. Antenatal care was being well taught, but intranatal methods were more essential and should be emphasised. He discussed the ways and means of carrying this out.

Mr. L. C. RIVETT (London) said it was a waste of time for students to be watching operations and suggested that they spent far too much time doing surgical dressing. He disagreed with rectal examinations and emphasised postnatal care.

Dr. SOLOMONS felt that a whole-time professor teaching in the university and also in the clinic was what was most desirable. Residence in an obstetric hospital for a sufficient period should be the keynote of the teaching of midwifery. It was a knowledge of the physiology of labour that was important. A certain number of cases should be conducted personally by the student, but more important still was that each man should see a large number of cases and actually write them up. He had become a complete convert to rectal examinations.

Prof. JOHNSTONE thought that practical experience of midwifery should be increased so that the student developed an obstetric conscience.

Dr. G. FITZGIBBON (Dublin) said that midwifery should be brought into line with the teaching of medicine and surgery.

Prof. BELL was surprised that none of the previous speakers had referred to infant welfare. He was convinced that the surest way to combat maternal mortality and disablement was to commence with the neonatal period and bring up healthy mothers. If such diseases as rickets and heart disease were prevented in children many obstetrical complications would be avoided later.

Dr. W. H. F. OXLEY (London) said he was taught obstetrics by whole-time midwives and felt that this was a useful way of gaining experience. He was speaking as an obstetrician and not as a teacher.

Prof. M. PHILLIPS (Sheffield) said that students should be saturated with normal obstetrics and not taught operative midwifery. He felt that by watching gynæcological operations during their obstetric course students were being taught preventive gynæcology.

Low Back Pain in Gynæcological Practice.

Dr. JAMES YOUNG (Edinburgh) said that low backache was one of the commonest symptoms in patients referred to the gynæcologist. In many of these cases the pain was dependent upon orthopædic conditions, and unless these were recognised the operative treatment of such associated conditions as vaginal prolapse and retroflexion was followed by disappointment. The cause could be ascribed to inherent weakness and in some cases to excessive strain during childbirth, but most often it was due to faulty posture dating from pregnancy or developing secondarily after damage of the pelvic floor and the production of prolapse.

Mr. W. A. COCHRANE (Edinburgh) drew attention to the mechanism of production and the pathology of the condition, illustrating his points by means of lantern slides and diagrams. He said that the symptoms were referable to disease of the lower spinal and sacral joints. Special orthopædic examination and careful scrutiny of good X ray pictures were important aids to diagnosis. Many women used their bodies in positions of mechanical disadvantage; the pelvic organs were not responsible for the pain and spasm of the back muscles was often found. He classified the cases into: (1) traumatic strain causing torn muscles and ligaments; (2) lumbosacral strain found most commonly in fat women; (3) sacro-iliac strain found in slender women; (4) combined pelvic joint strain; and (5) general postural cases. He summarised the diagnosis and treatment.

DISCUSSION.

Dr. R. S. S. STATHAM (Bristol) agreed with the importance of the conditions described, and said he had treated 41 cases with good results by means of massage and exercises. Sacralisation of the last lumbar vertebra had been found to occur in about a twelfth of the population. He referred with appreciation to Guy Hunner's work on ureteral strictures.

Mr. EARDLEY HOLLAND (London) said that backache in women had persisted as a traditionally gynæcological disease, but cases never really occurred in whom it could be directly ascribed to the pelvic organs. Pregnancy and labour were, however, common causes of sacro-iliac strain. He quoted the history of a case relieved of intractable backache by having her sacro-iliac joints fixed by means of a tibial graft.

Radiotherapy and Fistula Formation.

Dr. G. I. STRACHAN (Cardiff) discussed the frequency and method of occurrence of fistula formation in cervical carcinoma, the part played by radiotherapy, and the prevention of this complication. In a series of 254 cases fistulæ had developed in 22—viz., ten vesico-vaginal, nine recto-vaginal, and three recto-vesico-vaginal. The time of appearance of these fistulæ after radiation and the duration of life were discussed. No early cases developed fistulæ. He pointed out that the technique of radium application was the same in the cases where no fistulæ developed. All the cases were advanced, and in all except two there was an interval of several months between radiation and the appearance of the fistula, so that the radium probably had little influence on its formation. The points emphasised were bowel and bladder evacuation, with vaginal packing.

DISCUSSION.

Dr. CAMERON said he had employed the Stockholm technique extensively in the treatment of cancer of the cervix, having completely given up the Wertheim operation. He described in detail his methods, dosage, and results. He was giving radium a good try out in these cases, and if it did not prove satisfactory he would next resort to vaginal hysterectomy.

Mr. M. DONALDSON (London) divided fistulæ into those which were the result of radium and those which were due to the growth. He had not seen vesico-vaginal fistulæ but had found several between the rectum and vagina. He described his method of dealing with the latter. He did not agree that we knew which treatment was more likely to cause fistulæ.

Ovarian Grafting.

Dr. SOLOMONS read a paper on ovarian grafting from one woman to another. He reviewed the literature of auto- and hetero-ovarian grafting, dealing with the suitability of donors, indications, technique, and results, also with the possibility of pregnancy following grafting. He described in detail the methods employed in grafting a portion of the ovary taken from a healthy girl into the rectus muscle of a woman in whom an artificial menopause had been brought about by means of radium and who was anxious to menstruate again. The operation was successful and brought about the desired effect.

No time was left for discussion, and those desirous of commenting upon the paper were invited to contribute their remarks in the *Journal of Obstetrics and Gynæcology of the British Empire.*

Shorter Papers.

During the afternoon session Prof. A. H. DAVIDSON (Dublin) was in the chair, and Prof. GUGGISBERG read a paper on

CONDITIONS OF LIFE AND REPRODUCTION.

He divided life into: (1) intra-uterine with its ties to ancestors and parents; and (2) extra-uterine. The development of the child is uninfluenced by the mother's nutrition during its intra-uterine existence. The blood composition is constant, the placental metabolism cannot be influenced except by very extreme degrees of starvation which could only be brought about in experimental animals, conditions unlikely to be reproduced in human beings. The placenta is quite passive to an over supply; it merely picks out what is necessary from what is offered. His own experiments had shown that the placenta has a great vitamin storage capacity. A pregnant animal fed with antirachitic substances would produce young upon which the most extreme rachitic diet would have no effect. The fœtus receives, he said, a certain amount of protective factor from the mother which protects it after birth. He referred to the effect of civilisation upon fertility and the influence of nutrition, light, and meteorological conditions on the germ glands. Stress was laid on the fact that the sexual fitness of a woman is determined to a great extent before and during puberty.

Prof. **Whitehouse** referred to external influences causing death of the ovum in utero. He pointed out that if women who repeatedly aborted were given vitamin E whilst pregnant they might go to term. He had found that if a last child of a large family married an individual who was also the last child of a large family frequent abortions were more likely to occur.

THE HUNTERIAN COLLECTION.

Prof. J. H. **Bryce** (Glasgow) demonstrated the Hunterian collection of anatomical and pathological preparations at the University of Glasgow, drawing special attention to early embryos, injected preparations of decidua and placenta, and preparations to illustrate the comparative anatomy of the placenta. He also showed specimens illustrating injection of the lymphatics by means of mercury and Hunter's casts made from the preparations which were used for the drawings in his work on the gravid uterus.

INDUCTION OF LABOUR.

On the last day Dr. **Statham** took the chair and Dr. **FitzGibbon** read a paper on the induction of labour by puncture of the membranes. There was no case, he said, in which labour failed to follow by this method and it was free from any of the so-called disadvantages from loss of the liquor amnii. The method is applicable to all cases in the last six or eight weeks of pregnancy, and he held that it more nearly promotes the normal stimulation of uterine action than any other method. The primigravida showed a more rapid response to the induction than the multigravida, but in both groups labour was steady and rapid when it started. As much liquor as would make the presenting part press firmly on to the internal os should be allowed to run away. The best results were obtained by puncturing the membranes in front of the presenting part.

BLOOD EXTRAVASATION AND ALBUMINURIA.

Dr. **O'Donel Browne** (Dublin) said he had found as a result of clinical observations that there was an intimate relationship between blood extravasation and albuminuria. Even when only a small quantity of blood was extravasated, albuminuria developed if the blood was locked up. It was seen in ectopic pregnancy, post-operative hæmatomata in the non-pregnant, and in cases of traumatic hæmatoma. The albumin cleared up in all cases after the removal of the clot. Details of cases were given to illustrate that even small blood extravasations were capable of producing albuminuria.

UPPER URINARY TRACT IN PREGNANCY.

Dr. **Dugald Baird** (Glasgow) said that pyelitis of pregnancy was much more common than generally supposed, being predisposed to by the dilatation of urinary tract which occurred during pregnancy. That the ureters become dilated very early in pregnancy was shown by post-mortem findings, by dye excretion, and by pyelography. It was usually more marked on the right side. This dilatation has a deleterious effect on kidney function, causing delay in excretion and diminution of the power of the kidney to concentrate urea. In infected cases the dilatation and delay in excretion was greater, and in these cases he advised drainage of the pelvis by a catheter.

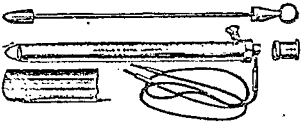
TRANSPLACENTAL MELANOTIC SARCOMA.

Mr. **Holland** reported a case of transplacental implantation of melanotic sarcoma from mother to fœtus. The patient had had a growth removed from the skin of the thigh and a recurrence which was also excised with the femoral and inguinal glands. Two months later she became pregnant and when seen near term was extremely ill with nodules in the skin all over the body. The lower uterine segment was occupied by a large soft mass which was presumed to be the placenta. Cæsarean section revealed a black placenta prævia. The child was apparently healthy. The mother died three months later. The child died when 8 months old and at post mortem its liver was found to be greatly enlarged by nodules of melanotic growth. Specimens and drawings were shown to prove that the tumour must have passed from the mother to fœtus by the placenta.

NEW INVENTIONS

A MODIFIED SIGMOIDOSCOPE.

I have devised a modification of the Lockhart-Mummery sigmoidoscope. The lamp, instead of being on a long stem, inside the lumen of the instrument, is recessed in its walls, and protected by a window which is situated a short distance from the distal end. The advantages of this arrangement are that the lamp and holder cannot be fouled by fæces, nor can the swabs be caught in the lamp. When the lumen of the sigmoidoscope does become soiled, the one action of cleaning the instrument also cleans the window behind which the lamp is recessed and protected. I have also had a rectal speculum made on the same principle.



The makers are John Bell and Croyden (Arnold and Sons), 50–52, Wigmore-street, London, W.

Frank Harvey, F.R.C.S. Edin.

Braintree and Bocking Cottage Hospital.—This Essex institution is to be re-named "The William Julien Courtauld Hospital" in recognition of the liberality of its donor and president.

Paddington Children's Hospital.—Last year 794 in-patients were treated at this hospital (a fractional decrease) at a weekly cost of £3 17*s.* 10*d.* and a total cost of £8 3*s.* 6*d.* each; their average stay was 14·77 days. Out-patients, who made 42,201 attendances, cost 7*s.* 9·8*d.* each. Voluntary payments from patients were £707, a heavy decrease; on the other hand, the Hospital Saving Association's payment of £1097 was an increase of £126. The convalescent home is to be moved from Slough which, as a big industrial town, is no longer suitable for the purpose, to a house on Bagshot Heath.

REVIEWS AND NOTICES OF BOOKS

Bronchial Asthma, its Diagnosis and Treatment.

By HARRY L. ALEXANDER, A.B., M.D., Associate Professor of Medicine, Washington University Medical School, St. Louis, Mo. London: Baillière, Tindall and Cox. Pp. 171. 10*s.* 6*d.*

Asthma and its Treatment.

By PERCY HALL, M.R.C.S. Eng., L.R.C.P. Lond., late Hon. Actinotherapist, Mount Vernon Hospital, London and Northwood. London: William Heinemann, Ltd. Pp. 130. 7*s.* 6*d.*

The Treatment of Asthma.

By A. H. DOUTHWAITE, M.D., F.R.C.P. Lond., Assistant Physician, Guy's Hospital. London: H. K. Lewis and Co., Ltd. 1930. Pp. 164. 7*s.* 6*d.*

AUTHORS of monographs may be divided into two classes—those who by investigating a subject make an original contribution to human knowledge and then write a book after a careful study of all the earlier published work. It is needless to say that such special investigations may be purely clinical, such as studying the effect of some new method of treatment on a series of cases, or it may be experimental so that the underlying pathology or the underlying principles of treatment are elucidated. The second class comprises those authors who claim no originality for their work, but have made a compilation of the works of others. These three books illustrate these two types of monograph.

Dr. Alexander's book is excellent, being an authoritative representation of the best work that has been carried out on the subject of asthma up to the date of its publication. Special attention should be paid to his discussion of the mechanism of the asthmatic paroxysm; it is interesting that he comes to the conclusion that bronchial spasm and mucosal œdema causing excess of mucous secretion occur simultaneously during the attack, and that they all play a part in the production of the dyspnœa. Other notable features of the book are the account of the migration of eosinophil leucocytes through the capillary walls to accumulate in the pericapillary and peribronchial tissues, and finally to penetrate into the bronchial lumen; the description of the Charcot-Leyden crystals; the acceptance of the view that the lungs are not uniformly involved during a paroxysm. Dr. Alexander has studied the size of the heart with special reference to the disputed question whether there is usually a right-sided hypertrophy, and records the measurement by radio-active methods of the blood-flow through the lungs in emphysema. His original work includes notes on the experimental investigation of the disease during life, and an account of the post-mortem examinations in three cases of asthma; and we learn that not more than 34 autopsies have been described in the literature. He found that the thickness of the bronchial wall for a certain type of bronchus is twice as great in asthma as in normal controls. The book is packed full of information of all kinds, and contains full references.

Dr. Percy Hall writes his book from the point of view of a physiotherapist. The two methods that he describes most fully are diathermy and actinotherapy, and he lays special stress on the value of the latter. Twenty-one case-histories are given at the end of the book. Dr. Hall has not attempted to deal with the history of the subject, nor to describe the various researches which have recently been conducted, and he gives no references or bibliography. We regret that the author did not confine himself to an account of those physiotherapeutic measures on which he is a known authority, and which he might have expanded further with advantage. Such excursions as he makes into the general pathology of asthma are marred by a number of statements concerning hypothyroidism, adrenal dysfunction, pituitary deficiency or abnormality, and vitamins, which are in some cases obvious, in others irrelevant to the argument. For instance, the presence of a harsh, dry skin, common in asthmatic subjects, is poor evidence that hypothyroidism is an important factor. Again, how does disorganisation of the lungs "throw a strain on other organs of excretion which have more than their share of the work to perform?" Does Dr. Hall suggest that there is ever any special excretion of carbon dioxide by the skin or kidneys? His explanation of the action of adrenalin is, to say the least, unusual. His work would have been more effective if he had confined himself to clinical description and avoided unproven theories.

Dr. Douthwaite's book is frankly a compilation. He disclaims any originality in the preface; but he might have taken credit for a good section on the treatment of asthma by means of physical exercises. He is in close touch with the work of the Asthma Research Council, and is thus able to take account of this work in his presentation of the subject. Contrary to Dr. Alexander—in this Dr. Douthwaite is surely wrong—he regards the dyspnœa as due to spasmodic contraction of the bronchi, considering that the swelling of the mucous membrane, if it plays any part at all, is of minor importance. Dr. Douthwaite draws on his own clinical experience for certain interesting cases. A useful chapter deals with the methods required for investigating a case, and describes the special tests employed. The description of anaphylaxis is poor; in a future edition an abstract of Dale and Kellaway's work should surely find a place. The introduction of the term allergism is unfortunate, or was this perhaps a printer's error? The book as a whole gives an orderly, clear, and complete account of asthma, including pathology, symptomatology, and treatment.

Abdomino-pelvic Diagnosis in Women.

By ARTHUR JOHN WALSCHEID, M.D., Director of Obstetrical and Gynecological Department of Pan-American Medical Center and Clinics, New York City. With 397 illustrations and one colour plate. London: Henry Kimpton. 1931. Pp. 1000. 52*s.* 6*d.*

THIS imposing volume is intended primarily for the post-graduate student and the general practitioner. The author has attempted to give the book "an anthropological subtratum, as an essential element in diagnosis." In place of predisposing causes of individual affections he has preferred to think of the idea of the type of patient who is predisposed to the affection in question, which he believes to give the reader a better aid to visualisation than is acquired by dealing with abstractions.

Part I., general gynæcology, opens with a chapter on anatomical considerations, but it is not the anatomy of the ordinary gynæcological text-book that the reader must expect. Instead he will find most interesting sections on such subjects as the normal female figure (profusely illustrated), *racial types*, primary and secondary sex characteristics, the influence of age on the female body and topographical visceral anatomy. In the next chapter general ætiological factors are considered and general symptomatology, and under the latter we find discussed the *types of endocrine and enteroptotic patient, anomalies of menstruation, uterine hæmorrhages, and sterility*. *Under sterility* no mention is made of the value and use of lipiodol in locating the site of tubal occlusion, and only the following obscure statement is made: "Although in theory the fluoroscope and roentgenography should be used these are unnecessary so long as the manometer functions." We conclude that the writer means "unnecessary so long as the tubes are shown to be patent" by passing air through them. But if there is an obstruction its position cannot easily be located without an injection or open operation. 113 pages are devoted to gynæcological examination and diagnosis. The length of this chapter is due to the fact that it includes such detailed directions as those for preparation and examination of frozen sections, embedding in paraffin, microscopic examination for gonococci, methods of determining amount of blood loss, the internal secretions in diagnosis, besides many other matters not usually met with in a gynæcological text-book.

In Part II., special gynæcology, the arrangement differs from that usually followed, in that in its nine chapters all the diseases and functional disturbances of each organ are discussed together. The grouping is therefore not primarily pathological but anatomical. Thus the reader who wishes to read up the diagnosis of gonorrhœa will not find it under one heading—e.g., infections of the genital tract—but distributed under vulva, vagina, and cervix. This seems to lead to much unnecessary repetition, and here and there the work would have gained by condensation into two-thirds of its bulk, especially when one considers that the bibliography (most of it German) only fills three pages. The principles of gynæcology as taught in this country at least are simple. We believe that this is because the teaching is based on the general and universal principles of pathology. If these are understood and applied, classification of symptoms and signs becomes easy; once depart from them and all becomes confused and difficult. Much of the pathological teaching in the book under review is open to objection. For example, in the section on cervicitis there is no insistence on the fact that the condition is due to infection. "Erosion results from leucorrhœa which latter may be infective or non-infective. It may result from mechanical irritation—friction against the contiguous vaginal wall. . . . It may be the result of laceration of the cervix which has caused obstruction of the ducts of the glandules of the cervix." Precisely how obstruction of the ducts of the "glandules" of the cervix causes "erosion" is left to the reader's imagination to discover! This, in our view, is bad pathology, or no pathology at all. In the section on chorion epithelioma (the term deciduoma malignum given as a synonym is obsolete) it is stated that it "grows from decidual cells." Every student knows nowadays that it grows from the chorionic epithelium. Nor is this a misprint, for farther on it is said that in lung metastasis the blood from the lungs "will be found to contain the decidual cells"! Some mention, too, might have been made in connexion with the diagnosis of chorion epithelioma of the important work of Zondek and Aschheim, Erhardt, and others on the value of the pregnancy reaction, especially as the book bears the date 1931 as the year of publication.

The reader will find much useful information in this book provided his patience does not give out in the prolonged process of extracting it. It is a work only for the experienced gynæcologist who can reject what is unsound, for without doubt there is much valuable matter. The illustrations are mostly good, some are excellent, but the microphotographs, except those taken from other works, are so poor as to be almost useless.

Recent Advances in Pulmonary Tuberculosis.

Second edition. By L. S. T. BURRELL, M.D., F.R.C.P., Senior Physician to Royal Free Hospital; Physician to Brompton Hospital for Consumption and Diseases of the Chest. London: J. and A. Churchill. 1931. With 32 plates and 17 text-figures. *Pp.* 240. *12s. 6d.*

TAKING stock of the advances made in the treatment of pulmonary tuberculosis since the first edition of his book was published, Dr. Burrell comes to the conclusion that they have been mostly along surgical lines. Hence his expansion of the chapter on thoracoplasty, extrapleural pneumolysis, and phrenic evulsion. Intercostal neurectomy, cauterisation of adhesions, and oleothorax are also discussed. Other new features of this edition are articles on poison gas and war injuries caused or aggravated by tuberculosis, and the problems raised by the combination of pregnancy with pulmonary tuberculosis. In the preface to the second edition the author states that the results of further experiments with B C G are included. This is quite true. But the account of the Lübeck disaster is very inadequate, and the general survey of the B C G literature is rather sketchy. There is another field in which the author might well have been more expansive. It is that of the X ray diagnosis of pulmonary tuberculosis, the work of Redeker and his school, and the teachings coming under the heading of "Frühinfiltrat." Dr. Burrell steers his way very sagely through the contentious paths of graduated labour and tuberculin treatment. Of the latter he remarks that while the beneficial effects of certain treatments, such as rest in bed, are plain, the benefit of tuberculin is still a matter of debate.

Hypersensibilités spécifiques dans les affections cutanées.

By PASTEUR VALLERY-RADOT and Mlle. HEIMANN. Paris: Masson et Cie. 1930. Pp. 146. Fr.25.

THE importance attributed to a specific susceptibility in the genesis of cutaneous disease has greatly increased during recent years. In urticaria, this ætiological factor, has long been accepted and most authorities are now agreed that eczema, dermatitis artificialis—which includes dermatitis due to medicaments applied or ingested—Quincke's œdema, and even the dermatitis herpetiformis of Duhring, should be grouped under the manifold symptoms of allergy. A collective survey such as this, illustrated by many brief case records, marks progress, and will be welcomed by dermatologists all over the world. The authors do not enter too deeply into the complicated considerations which underlie the experimental work performed by themselves and other investigators in France, America, and Germany. The work in this country of Cranston Low, who has contributed some important original observations, and a most valuable text-book, appears to have escaped their notice. They pass quickly to a survey of clinical data in relation to the two recognised types of cutaneous allergy—viz., the acquired, corresponding with the experimental type, and, secondly, the so-called spontaneous hypersensitivity at first contact or on ingestion, for which the term idiosyncrasy is sometimes used. In this chapter are described the blood and vascular phenomena which always precede and sometimes accompany the cutaneous manifestations, and without which, according to these authors, the diagnosis of allergy ought not to be made. The various and increasingly numerous protein and non-protein substances—the antigens—which have been found at one time or another to elicit the syndrome are enumerated in detail, with case-histories, and the following chapter contains a full account of the diagnostic means to prove their specificity.

The second part of the book examines evidence for classifying the dermatoses mentioned above as allergic in origin, and the third is a most valuable essay on treatment. The practitioner will find all that he requires about treatment in this section, since it includes the therapeutic weapons which are used when the antigen cannot be discovered. The chronic sufferer from urticaria is difficult to cure, and every physician has cases of eczema or dermatitis herpetiformis which have resisted the most drastic efforts to relieve them. In these pages will be found the latest fruits of therapeutic research.

Seasonal Variation in Man.

By Edmund Hughes, M.R.C.S., L.R.C.P. London: H. K. Lewis and Co., Ltd. 1931. Pp. 126. 6*s*.

Dr. Hughes starts with the reflection that mammalian physiology has been built on the expectation of annual inactive periods during cold weather, and thinks it possible that in a heat-stable animal such as man traces of the consecutive chemico-physiological rhythm still persist, and may become manifest under appropriate conditions. We agree with him that conventional pathology does not represent any intense conviction of the importance of our evolutionary history; it would be well to trace out the functional implications of evolution more fully. But we confess that we find Dr. Hughes's treatment unsatisfactory; he is too vague, and his speculations often overrun that indefinite line called legitimate. His readers will, we imagine, prefer to pursue his general idea along lines of their own.

Clinical Methods in Tropical Medicine.

Fourth edition. By G. T. Birdwood, M.A., M.D., D.P.H., Lieut.-Colonel, I.M.S., late Civil Surgeon, Lucknow. With Contributions by Various Authorities. Calcutta: Thacker, Spink and Co. 1930. Pp. 366. Rs.8.8.

The object of this small volume as set forth on the title-page is to act as a guide for students and general practitioners in the tropics in diagnostic and therapeutic measures, and this it does in plain and simple language. That there is much that is unscientific and misleading in these pages we are bound to admit. The description of the malaria parasites is so vague that it would be difficult even for a trained observer to differentiate between them without more help than is given here. The scope of the work is ambitious; the subjects dealt with range from methods of blood examination to the diagnosis and treatment of gonorrhœa, tests for renal function, the removal of the brain of a rabid dog, and the method of embalming a dead body being included. In the treatment of kala-azar no mention is made of the pentavalent compounds of antimony. The wisdom of including in such simple tracts as leaflets to village headmen notes on the diagnosis of relapsing fever and the Spahlinger treatment for tuberculosis is open to criticism.

Recent Advances in Physical and Inorganic Chemistry.

Sixth edition. By Alfred P. Stewart, D.Sc., Professor of Chemistry in the Queen's University of Belfast. London: Longmans, Green and Co., Ltd. 1930. Pp. 387. 18*s*.

In order to keep the work up to date the author has wisely deleted chapters from his last edition and has added new ones; this is a much wiser plan than continuously increasing the size of the work. The author in this book covers a wide range, but it is mainly devoted to molecular physics. Starting with chapters on line spectra the reader is taken through recent developments in X ray spectra, the question of radio-activity and its relation to atomic disintegration, and from there to the various emanations such as radon and thoron. The author then plunges into what to most medical and biochemical readers is a closed book, the isotopes, and the conception of the structure of the atom. The value of a book of this nature to the physicist is small, since it is too elementary for him, and the question arises whether it is sufficiently clear to enable the general reader to understand it. We find that it is written very clearly and that it is possible for a non-mathematical person to understand and enjoy the greater part of it. The author deserves congratulation on this fact and also on his general attitude. He neither patronises his readers nor attempts to thrill them by adopting a forced or dramatic style. The book will be found valuable by workers in collateral sciences such as physiology, biochemistry, bacteriology, and pathology, and should be kept in their departments for reference.

Photobiologie.

Grundlagen, Ergebnisse, Ausblicke. By Ludwig Pincussin, Dr. Med. et Phil., Direktor der Biolog.-Chemischen Abteilung am Städt. Krankenhaus am Urban zu Berlin. Leipzig: Georg Thieme. 1930. Pp. 543. M.36

The author of this work is a well-known authority who has himself contributed much to our present knowledge on light in its biological applications. This book will add to his reputation and can confidently be recommended to those who wish to review the subject. A third of the book is given up to the physics and chemistry and the remainder is concerned with the biological effects of light; this latter part is particularly clear and informative. The changes in the skin, the study of pigmentation, and the diseases which are associated with hypersensitivity to light (hydroa, eczema, solare, and so forth) are fully considered, but the author admits that attempts at desensitisation in these conditions have so far been fruitless. Of special interest to medical readers are the chapters on the action of light on micro-organisms, on toxin and antitoxin, on calcium metabolism, and on rickets.

The value of this erudite work is enhanced by full references to the literature and a good index.

THE LANCET.

LONDON: SATURDAY, MAY 9, 1931.

THE PASTEURISATION OF MILK.

Recent debates in Parliament and discussions in the press have shown that this country lags behind many others both in its consumption of milk and in the quality of the milk it consumes. As Lord Astor pointed out,[1] Canadians drink twice as much per head, Americans three times, and Danes and Swedes six times as much as we do. Our under-consumption of milk is no doubt partly due to faulty education, but both defects are certainly due to our failure to grapple with the problem of producing an adequate quantity of safe milk. In the Memorandum on "Bovine Tuberculosis in Man" issued this week by the Ministry of Health[2] the present position is summarised, the figures agreeing substantially with those given by other authorities. Although the death-rate from non-pulmonary tuberculosis in England and Wales is decreasing, the incidence is still deplorably high. The report declares it probable that more than a thousand children under 15 die of bovine tuberculosis every year. Lord Moynihan,[3] speaking in the House of Lords on Feb. 10th, quoted figures showing that over 30 per cent. of tuberculosis in children up to 15 in England is of bovine origin; and he stressed the adult morbidity, sometimes unrecognised, from this source. He quoted authority for the statement that contaminated milk is responsible for 70 per cent. of the tuberculous diseases of bones and joints, and for some 60 per cent. of enlarged tuberculous glands in the neck, while in Scotland 90 per cent. of glandular enlargement in the neck and 60 per cent. of bone and joint tuberculosis are ascribed to milk-borne infection. He pointed out that the nation lost a hundred people from and spent a quarter of a million pounds every day on tuberculosis. The Memorandum states that the proportion of milch cows in this country infected with tuberculosis is probably not less than 40 per cent.

The spread of bovine tuberculosis to the consumer of milk can theoretically be avoided in three ways: (1) by ensuring that only milk from healthy cows is marketed; (2) by ensuring that only healthy milk is sold; (3) by teaching all consumers to boil their milk as soon as it is received. The last method is obviously a measure of desperation. Lord Moynihan states that milk taken into his own house is immediately boiled and holds that its nutritive value is not diminished thereby; but it is idle to expect that all or even most of the households of the country would follow this procedure, and there is good authority for the belief that boiling impairs the calcium and phosphorus content and destroys some vitamins —indeed, Lord Moynihan admits this. His suggestion that these defects can easily be compensated may be true for well-organised and leisured households, but the need to add to her children's diet special factors which ought to be present in their natural food lays a heavy burden on the already harassed housewife and is a duty that the careless will certainly neglect. It may be argued that she should not be told to boil it but to heat it to such a degree and for such a time that the pathogenic organisms are destroyed while the food values are retained—a kind of amateur pasteurisation. The answer to this proposal is that pasteurisation is not a method which can be applied by amateurs. The Memorandum stresses the very narrow limits of temperature within which the bovine tubercle bacillus is killed while the food value is unimpaired. Strict scientific control, it states, is necessary for efficient pasteurisation. All this practically means that the housewife cannot deal adequately with the milk as delivered if she is to regard it as requiring purification; its cleanliness must in some way be ensured by the producer or the dealer. The only means by which the dealer can render milk safe without unduly spoiling it as a food is pasteurisation. This is defined in the Milk (Special Designations) Order, 1923 as the retention of milk at a temperature of not less than 145° F. and not more than 150° F. for at least half an hour, and then immediate cooling to a temperature of not more than 55° F., the milk being heated once only and not otherwise treated by heat. Pasteurisation, if performed with efficient apparatus and continually controlled by bacteriological tests, will reduce the danger from milk-borne infection to a negligible amount, but, if these conditions are lacking, the method is untrustworthy. The first method—that of ensuring the health of the herd and the cleanliness of the milker—is the ideal one, but at the present time it presents so many difficulties as to be incapable of general application throughout the country. It implies that all milk-producing herds shall be kept free from tuberculosis, and shall be periodically inspected by experts. Tuberculosis is so insidious and easily propagated, cleanliness is so difficult to maintain, and men capable of supervising dairy herds are so scarce that for years to come the ideal of a pure source over the whole country must remain an ideal. Nevertheless there is in existence an increasing number of producers of certified and Grade A tuberculin-tested milk, who show that it is practically possible to keep herds free from disease and to market milk —but at a price—safe for children without heat treatment.

The important question is what measures the legislature should adopt at the present time to reduce the incidence of milk-borne diseases, of which tuberculosis is by far the most formidable. Opinions are divided into two main schools. One concentrates on compulsory pasteurisation: the other regards pasteurisation as an unfortunately necessary makeshift, which, if made compulsory, would indefinitely postpone the attainment of the end which it thinks the only one worth aiming at—the universal production of clean raw milk. A group of representative medical men, headed by Lord DAWSON, have recorded their opinion [4] that, "while no effort should be relaxed to improve milk at the source, the entire milk-supply—excepting 'certified milk'—should be pasteurised." Prof. J. C. LEDINGHAM has roundly declared that [5] "no raw milk can be regarded as safe." The other side is represented by Col. C. MADDOCK, the honorary secretary of the organisation of the producers of tuberculin-tested milk; in a letter to this journal he states that,[6] "treated milk is not of equal value to fresh milk," that it is important to preserve "an open market for the sale of fresh milk from licensed tubercle-free herds at a reasonable price," and that to tamper with one of Nature's foods may be "putting the hands of the clock back." The advice which seems to us, however, to carry the greatest conviction and to suggest a positive course of action most suitable to the circumstances is that of Dr. W. G. SAVAGE, the county medical officer of health for Somerset, which is supported by the *Medical Officer*.[7] Dr. SAVAGE has studied the whole problem of milk production in a big milk-producing county and has made himself familiar with all its aspects; those of the farm and factory as well as those of the laboratory. In THE LANCET of March 7th,[8] after weighing the evidence, he suggested that an Act should be passed enabling the large local authorities, after inquiry by the Minister of Health, to require all milk produced or consumed in or entering their area, other than certified or Grade A (T.T.) milk, to be pasteurised. The advantages which such a scheme would possess include the effective control which it would give to progressive authorities; the experience of pasteurisation which would result from its operation; the mitigation of hardship to the small local dealer compared with that which would fall on him under an Act affecting the whole country; and the elimination of the present practice of inefficient heat treatment simply to keep milk from going bad before delivery. The powers given to a local authority would include powers to simplify and encourage the production of clean milk from tuberculosis-free cows—i.e., to adopt measures such as an agreed simplification of nomenclature, unification of control, and veterinary assistance. But whatever the immediate action advised, it is essential that all concerned should keep it in the front of their mind that the production of clean milk from healthy cows must be increased by every possible means. Some of these means are suggested by Dr. SAVAGE in his article. The suggestion has been made that the Government should set up a Royal Commission to inquire into the whole question of milk production. The matter is too urgent and important to be shelved in this way. There is at the present moment a committee of the People's League of Health in session on the problem of bovine tuberculosis; it includes among its members, besides Dr. SAVAGE, Col. MADDOCK, and Prof. LEDINGHAM, representatives of the largest producing firms and of the scientific aspects. Its report will be of great value, and until it is published there is no need for the duplication of the work through any other body.

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[1] The Lancet, April 4th, p. 771.

[2] Reports on Public Health and Medical Subjects, No. 63. H.M. Stationery Office. 1931. Pp. 25. *6d.*

[3] The Lancet, Feb. 21st, p. 443.

TUBERCLE IN THE BLOOD.

THE game of cross questions and crooked answers has been thoroughly well played in the last 20 years on the subject of tubercle bacilli in the blood stream. The early experimenters, in endeavouring to find tubercle bacilli in centrifuged blood, fell into various pitfalls. Either acid-fast bacilli crept in from extraneous sources or artefacts were mistaken for tubercle bacilli, and positive results in some cases reached as high as 100 per cent. This line of action was therefore abandoned as unfruitful and workers next took to animal inoculation tests. Here again the results were wildly variable, some workers encountering dismal failure, others reporting a high percentage of positive results.[1] A new phase has now been reached by the invention of highly specialised culture media on which tubercle bacilli can be grown in primary culture with great readiness. Such media are those of Sweany and Evanoff [2] and Löwenstein. The medium devised by the latter, which introduces a new principle in bacterial culture, has yielded remarkable results, even to the extent of producing positive cultures in cutaneous lesions of suspected tuberculous origin. The next step would appear to be a careful study of the biological characters of the acid-fast bacilli grown on these new culture media. As a result of A. S. GRIFFITH's work on lupus strains it has long been known that the tubercle bacilli isolated from skin lesions may be of atypically low virulence for the guinea-pig. A strict comparison of the organism isolated from the blood of skin cases on Löwenstein's medium with the detailed work of Griffith is needed. There is, too, evidence in other directions that the acid-fast bacilli isolated on these special media from other sources are not always tubercle bacilli of typical biological characters. The whole question of these atypical strains—especially atypical in their effect on the guinea-pig, which is not exactly a living test-tube—is one of great interest and importance; but we shall be well advised to suspend judgment, at the moment, as to their precise clinical significance.

Turning now to the clinical side of the question there are still several points needing elucidation which when clear may explain the varying results of earlier workers. It is important to know, for instance, whether the positive findings are associated with what is generally known on the

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[4] THE LANCET, 1930, ii., 1315.

[5] Ibid., 1930, ii., 1368.

[6] Ibid., 1930, ii., 1367.

[7] March 28th, p. 141.

[8] THE LANCET, March 7th, p. 546.

[1] THE LANCET, 1921, ii., 193.

[2] Sweany, H. C., and Evanoff, R. S.: Tubercle, 1929, ii., 404.

Continent as Ranke's secondary stage and with that alone, or whether they are also indicative of a possible hæmatogenous spread in the tertiary stage in which dissemination has occurred, as it apparently does sometimes, even before (but generally after) resistance has broken down. To these questions must be added those pertaining to the numbers of tubercle bacilli circulating in peripheral blood, a problem which has recently been studied by Caussimon.[3] Obviously, as he points out, actual numbers have a bearing on the facility with which positive blood cultures can be obtained. A further question is raised in the experimental work of Prof. G. Dreyer and Dr. R. L. Vollum which appears on another page of this issue—namely, the life-cycle of the bacillus in relation to blood culture experiments. These writers have worked with a special technique[4] of growing *B. tuberculosis*, not on the surface of broth as is usually done, but by growth in the depths of veal-peptone-bouillon. In positive cultures small granules of growth appear at the bottom of the flasks on this media and can be transferred to other flasks. A series of subcultures of a special strain of *B. tuberculosis* was carried on in this way for three and a half years, and during that time the strain showed no tendency to produce a typical surface growth. Cultures thus grown occasionally turned out to be more virulent than cultures of the same strain grown on ordinary Petroff's medium. From this starting-point the authors proceeded to make a series of animal tests. Inoculating animals subcutaneously, intraperitoneally, or intravenously, they obtained positive cultures from the heart blood of these animals post mortem, and they believe that a bacillæmia is a regular occurrence in guinea-pigs infected with bacilli of human or bovine type, of high or low virulence. But this is not all. The writers noted that in granules from this type of cultures there were, in addition to the acid-fast rods, a considerable proportion of non-acid-fast organisms, some of which stained a deep blue with counter stain. They also noted numerous pairs of bacilli in a V or parallel arrangement in which one organism was more or less acid-fast while the other had taken up the counter stain. This arrangement was seen so regularly that the authors were driven to the conclusion that the non-acid-fast member had probably grown directly from the acid-fast one. They are therefore of opinion that these non-acid resistant organisms are of the greatest importance in the biology of the tubercle bacillus and suggested that such forms of the bacterial cell, whether growing in culture or in a tuberculous lesion, may be so small as to pass through a filter which would hold back most bacilli. They believe that as these smaller forms increase in size and age they acquire the property of fixing stain and eventually become acid-fast, and presumably are then too large to pass through the pores of the bacterial filter.

This work carries us back to the researches on the so-called filtrable virus form of the tubercle bacillus which has been so conspicuous a part of French investigation during the last few years. The whole question is fraught with very considerable technical difficulties which perhaps only the trained laboratory worker fully appreciates and much taking of pains will be necessary before a conclusion can be reached. As Prof. Dreyer and Dr. Vollum remark, the weight of evidence at present appears to be against the filtrability of the infecting material through the finer filters, such as Seitz and Chamberland L 5, but they give their support to the side of those who believe that "the acid-fast organism of Koch's classical description is not the only form in which *B. tuberculosis* occurs." This view of the matter has exercised the minds of bacteriologists for 30 years or more. Most of the previous work has been done with sputum, pus, and tuberculous tissue, and Dreyer and Vollum have added new interest to the problem by approaching it from a fresh angle—viz., blood culture in experimental animals. Their descriptions of the bacilli in deep cultures are not unlike those in very old cultures; vide for example a short account given some years ago by Gloyne[5] of a culture which had remained untouched for a period of nearly six years but was still viable. The appearances on the old culture, to which possibly Dreyer and Vollum's deep culture bears some analogy, doubtless exemplify an attempt of the bacillus to live in an unsuitable environment. How far the tubercle bacillus adopts this method of maintaining itself under unfavourable circumstances in the human body we do not know.

THE SURGEON'S RESPONSIBILITY.

Well might Lord Justice Scrutton observe that the recent appeal in Dunlop *v.* James was important to the medical profession. The Court of Appeal judgment (noticed in The Lancet a fortnight ago) seems to fix upon the operating surgeon the legal responsibility for checking the tally of swabs and to negative the delegation of this duty to a nurse, however perfectly trained. "It is said for the defendant," remarked the Lord Justice, "that the doctor is quite entitled to rely on the count of a competent person, although competent persons do make mistakes. Before there is any count, there is a duty on the doctor." Lord Justice Greer followed to the like effect. "The fact that counting may be exercised by some other person does not absolve the doctor from the necessity of making some reasonable search before he puts any question to the nurse with regard to the count." As will presently be seen, Dr. Dunlop made such a search, but nevertheless has to pay a substantial sum in damages and costs. Whether it be the fault of the law or the fault of the jury, this doctrine of the surgeon's responsibility seems to ignore the common and necessary practice of modern surgery, the interests of the patient and the specialised efficiency of the trained nurse.

The facts of Mrs. James's action against Dr.

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[3] Caussimon, J.: Presse Médicale, March 25th, 1931, p. 435.

[4] The Lancet, Jan. 3rd, p. 9.

[5] Gloyne, S. R.: Tubercle, 1920, ii., 12.

Dunlop are briefly these. Dr. John Dunlop, assisted by Dr. James Sullivan, performed a gall-bladder operation upon her husband at the Ebbw Vale Hospital in December, 1928. There were also present Dr. John Sullivan, the anæsthetist, Miss Ford, the matron (who had charge of the instruments), and Miss Hutchings, the theatre sister, besides two probationers. The patient required oxygen, and it was twice necessary to use artificial respiration; otherwise the removal of a large number of gall-stones proceeded normally, the operation appeared successful, and Mr. James was in due course sent home. His health, however, did not mend. In the following March a further examination at the Llanidloes War Memorial Hospital showed that a swab had been left in his body, and soon afterwards the patient died. His widow sued Dr. DUNLOP at Shropshire Assizes. There was evidence that at the original operation the question was asked, "Are all swabs out?" and that the answer was "Yes." Mr. Justice BRANSON pointed out to the jury that there was also evidence that both Dr. Dunlop and his assistant had made some independent search; they had "felt round" to see if any swabs were left and had found none. In his answers to interrogatories, earlier in the action, Dr. Dunlop had replied in the negative to various questions whether he had, during or after the operation, counted the swabs used or removed from the body or whether he had taken any steps to check the numbers. Clearly he relied on the ordinary surgical practice by which this task is left to a trained sister. The evidence of what occurred at the operation was hardly in dispute, but the statements as to the checking by the sister were not so definite as they should have been, though, of course, the witnesses were speaking of something which happened some time ago. Neither plaintiff nor defendant called Miss Hutchings (whose duty it was to keep tally of the swabs) as a witness. There was no doubt that Dr. James Sullivan asked the question, "Are all swabs out?" Four witnesses said they heard it. But the evidence as to the answer, which we may naturally assume must have been in the affirmative, was varied. Dr. Dunlop said he heard a reply in a woman's voice, coming from where the matron and theatre sister was standing; he did not remember the exact words, but the answer was satisfactory. Dr. James Sullivan said very definitely that he heard the reply "Yes" from Miss Hutchings, to whom his question was addressed. Dr. John Sullivan said he heard a woman's voice say "Yes," and was convinced it was Miss Hutchings. It is true that Miss Ford, the matron, could not say she heard any reply; but it may fairly be stated that there was reasonably sufficient evidence that the theatre sister gave the assurance which had been asked for. The significance of these details of the evidence will appear when we come to the material questions put by Mr. Justice Branson to the jury. The first question was: Did the defendant make such personal search in the wound as was reasonable and proper, having regard to all the circumstances of the case? The jury answered "No." Secondly, did the defendant receive an assurance from Miss Hutchings that all the swabs were removed? The jury answered, "Evidence not satisfactory." Thirdly, having regard to all the circumstances of the case, was the defendant justified in closing the wound without making more extensive search for swabs, either by reason of such search as was made or by reason of the assurance of Miss Hutchings or by a combination of the two things? The jury answered "No." These answers amounted to a verdict of negligence against Dr. Dunlop, and damages of over £2000 were awarded. It may be added that on another and different allegation of negligence Dr. Dunlop succeeded; an attempt to fix him with blame for not having used tagged or taped swabs failed, medical experts on both sides agreeing that such use was neither universal nor indispensable.

Dr. Dunlop appealed, on the ground that the jury's verdict was against the weight of evidence, and asked for a new trial. But the Court of Appeal has refused to say that the jury gave a perverse verdict. Lord Justice Scrutton seems to have thought they might naturally be impressed by the "size of the towelling," and might well feel it was careless not to have removed something so large, though indeed it had been amply explained by various witnesses that the movement and discoloration may make the detection of swabs by no means a simple and automatic process. As to the jury's answer that the evidence of the nurse's assurance was "not satisfactory," this might mean, said the Lord Justice, that the jury attached importance (as they were entitled to do) to the three facts that the defendant did not call Miss Hutchings as a witness, that the matron was not able to say she heard the reply, and that Dr. Dunlop's testimony here might suggest that he assumed the particular happening of what usually happened. If the jury's answer to the second question stood ("evidence not satisfactory"), it was an end of the case. Dr. Dunlop, of course, could not defend himself by relying on the responsible nurse's assurance that all swabs were out if the jury was not satisfied that the assurance had been given. In view of the evidence already summarised, one would imagine that most juries would have been reasonably satisfied on the point. The judges of the Court of Appeal do not say that they would not themselves have been satisfied. They merely say that, if the jury was not satisfied, there was some ground for a jury to take that view, and therefore the verdict cannot be disturbed. Unfortunately, the answer "evidence not satisfactory" makes the case an indifferent opportunity for a further appeal to the House of Lords upon the broad issue which so vitally affects all surgeons.

That issue can be clearly understood from the language of expert witnesses. In Beckh *v.* Sinclair,[1] Mr. Donald Armour said that a modern surgical operation was a ritual in which every detail must be carried out with meticulous care; those who were present were a team, each member trained in his own duties; the surgeon as a rule did not interfere to see whether the others did their jobs; the modern nurse was a highly trained technician. Similarly, in the same case, Mr. H. S. Souttar said that, unless there is a separation of functions at an operation, it would be impossible to carry on modern surgery; the surgeon cannot allow his attention to stray. Giving evidence at Shrewsbury for Dr. Dunlop, Prof. Leonard Gamgee explained the exact duties of the theatre sister and the grave disadvantage to the patient if the surgeon is distracted from his difficult and delicate task. He could himself testify to the dangerous strain on the surgeon conducting an operation in emergency, without trained assistance, through the extra duty of counting swabs. He spoke also of the grave risk of infection if the surgeon is to touch swabs which have been used, so as to keep a tally of them himself. Mr. Justice Branson put the issue clearly. "One of the great points between the two sides in this case is whether it is the duty, in a case of this kind, of the surgeon himself to bear in mind, either consciously or subconsciously, the number of swabs that he has used, so that he can have his own idea as to whether he has removed them all or not; or whether, acting according to the ordinary practice of operating surgeons in this country, he is entitled to take the answer given by the theatre sister and to rely upon that without charging his own mind with keeping a record of the number of those dressings which he has used. That is a question of fact." Unhappily the jury at Shrewsbury decided this question of fact in a manner inacceptable to the ideas of modern surgery and blind to the interests of the patient. In the South African case of Van Wyk *v.* Lewis, where the surgeon was more fortunate, three main points were established. First, as in English law, the surgeon who contracts to operate undertakes that he will perform his task with average technical skill and reasonable care. Secondly, the relation of surgeon to trained nurse is not that of master and servant, or anything like it; she is an independent assistant, though under his control as respects the operation. This point has been obscured in English law by Lord Justice Farwell's observations in Hillyer *v.* St. Bartholomew's Hospital, which are sometimes quoted as relieving the hospital of responsibility on account of the surgeon's general control of the nurses at an operation. Thirdly, regard must be had to the prevailing professional practice. How long is it to be before judges and juries in England take something like the South African view? Meanwhile the position is serious. The necessary delegation of duties at a modern surgical operation is ignored. Further, even if a jury was satisfied that the responsible trained nurse had assured the surgeon that all swabs were removed, the Court of Appeal suggests that the surgeon must still make his own independent search. Lord Justice Scrutton says that the surgeon puts the swabs in, knows where they are, and is responsible for taking them out again. This view seems to assume that the surgeon will easily find the swab exactly where he first put it. He knows, of course, that the swab is within the abdominal cavity, but will the exact location be immutable? The court hardly seems to appreciate the possible covering over by the intestines or other organs and the disturbing effect of artificial respiration. The surgeon apparently is to grope searchingly. The nurse's assurance, it seems, is merely an additional confirmation, not authoritative information by itself. "No doubt," said Mr. Justice Branson to the jury, "the most efficient way would be for each swab to be counted in by everybody present and counted out by everybody present," but then, as he proceeded to explain, some of those present have other things to do. This latter fact is elementary and vital. The law must not suppose that a surgical operation upon an anæsthetised patient can proceed at the same majestic pace as the day's work in the law courts.

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[1] THE LANCET, 1927, ii., 1040.

THE GLASGOW CONGRESS.

AT the eighth British Congress of Obstetrics and Gynæcology, reported elsewhere in our columns, the main subject of discussion was ovarian neoplasm. Oöphorectomy was one of the earliest successful surgical interventions, its technique has been developed to a nicety, there is a wide uniformity in treatment, and most surgeons deal alike with the difficulties they encounter. But on a few points there is divergence. In answer to the question whether the bulk of a large cyst should be diminished by tapping before its removal, some say that since malignant change never occurs in cystadenoma or papillomatous cysts, there is no reason why fluid should not be withdrawn in order to diminish the size of the incision. Others advocate removal intact through a large incision owing to their fear of dissemination of tumour material. Had those who favoured puncture at the Congress analysed their results from this point of view it would have been helpful. It is difficult to understand how continental writers on ovarian tumours can record so high a percentage of malignant change in innocent tumours if they have no definite proof. Innocent cysts are found with frank malignant disease in one part only. On the whole, apart from folliculomata which received a fair amount of attention, speakers kept chiefly to the clinical point. Prof. Blair Bell suggested a classification of ovarian neoplasms for the guidance of later speakers, whose collected evidence should on further scrutiny throw light on other points. What is clearly lacking is a satisfying knowledge of the ætiology and ontogenesis of ovarian neoplasm, the cause of some of its physical signs, for example ascites in some cases, and the reason for the secondary involvement of the ovaries from carcinoma of the breast and gastro-intestinal tract, when there is no mass ulcerating into the peritoneal cavity to cause transcœlomic implantation and permeation of lymphatics. That the ovary forms an excellent nidus for growth is shown by the ease with which grafted tumours can be propagated in the ovaries of rabbits. A feature in treatment which does not seem to have been fully appreciated before is the high mortality from surgical intervention in ovarian tumours, as compared with hysterectomy for fibroids. Apart from this main topic some of the other subjects touched on should bear early fruit. The great army of women referred to the gynæcologist on account of backache may look forward to some relief at the hands of the orthopædic surgeon. The effective plea to bring the teaching of obstetrics and gynæcology into line with that of medicine and surgery should do something towards reducing maternal mortality and disablement.

ANNOTATIONS

NATAL AND NEONATAL MORTALITY IN INDIA.

Dr. Christine J. Thomson has recently undertaken, under the auspices of the Lady Irwin Research Fund, an inquiry into the causation of stillbirths and neonatal deaths in India. Her report[1] consists of three main sections: the first summarises 200 post-mortems, the second deals with the results of an all-India questionaire to obstetric institutions, while the third part sums up the conclusions and appendices give all the results in tabular form.

In the post-mortem series 19·5 per cent. of the deaths were due to the complications of labour, but this is an under-estimate, because so many of the cases were macerated fœtuses. Tears of the dural septa were found in 20·9 per cent. of the fresh cases, half of which were breech deliveries, one-third being spontaneous vertex deliveries. Gross visceral hæmorrhages were present in 35 cases. There were 27 cases of antepartum hæmorrhage, 11 being placenta prævia. Eclampsia caused 14 per cent. of the infant deaths in Calcutta, 8 per cent. in Madras, and 1·4 in Bombay; the incidence of "certain" syphilis was 14·5 per cent., which suggests that this disease as a primary cause has been over-estimated. It is a distinct surprise that only 10·5 per cent. of the deaths could be attributed to tropical diseases, but the figure of 2·5 per cent. for malaria is regarded as an obvious under-estimate. Fœtal states accounted for 8 per cent. and there was a curiously high incidence (8 cases) of malformation or disease of the urinary system. Placental disease was found in 5·5 per cent., all of the cases being premature. Placental leucocytosis appeared to be commoner in India than in the west (10·4 per cent. of the placentas examined).

The questionaire revealed a significantly higher stillbirth-rate among Mohammedans than among Hindus, while Christians showed the lowest figure. The especial prevalence of osteomalacia in North India was revealed by the preponderance of multiparæ over primiparæ in cases of death due to contracted pelvis. In most districts there was considerably less antepartum hæmorrhage than the average British figure of 18·9 per cent. The figures for toxæmias of pregnancy vary so much that comparison is impossible; the incidence was 1 per cent. in Delhi and 17 per cent. in Calcutta. The incidence of deaths from acute maternal disease was from 11 to 18 per cent., much higher than in the west, and Bombay showed a large proportion of deaths from malaria and dysentery. A considerably higher percentage of children seemed to die from marked prematurity in India than in the west. Data on neonatal states in the questionaire must be regarded with caution in the absence of pathological examination, and there are practically no figures of placental disease.

In order to pave the way for further work Dr. Thomson attempts certain tentative generalisations and recommendations. Apart from obvious administrative reforms such as improved instruction in midwifery and education of the general public and the provision of more antenatal clinics and hospital beds, she suggests certain lines of action and research. Medical students and pupil midwives, she says, might attend special lectures on the causation and pathology of stillbirth and neonatal death, to focus attention upon an important field of obstetrics. Modern methods for the resuscitation of the asphyxiated infant might be more widely applied in hospitals; the installation of up-to-date apparatus for oxygen and carbon dioxide inhalation would certainly save life. Pædiatricians should be appointed on the consulting staffs of maternity hospitals and given special nurses and accommodation for treating birth injury, prematurity, and neonatal disease. The lines along which research could be profitably directed include the relation of poverty and malnutrition to the condition of the Indian child at birth; the scientific study of diet in relation to pregnancy; the establishment of standards of fœtal maturity for the various communities and districts and the effect of tropical diseases upon the stillbirth and neonatal death-rate. The curious geographical distribution of eclampsia obviously calls for investigation, as do also syphilis and placental disease. Malaria parasites should be sought in the placenta, and as placentas are easily obtainable there is a rich store of material to hand. The realm of research is almost unlimited and the results of the work may not only save countless lives in India but may produce valuable knowledge which can be applied all over the world.

ERUPTIONS OF THE AUDITORY MEATUS.

THE external auditory meatus is a tract of common land whose oversight is claimed by otologist and dermatologist. The views of both overseers were heard at the Royal Society of Medicine on May 1st, when Mr. A. R. Tweedie took the chair, and Dr. H. W. Barber spoke on eruptions involving the meatus. Dr. Barber classifies such eruptions into those due to external infections, those due to infective organisms reaching the skin through the blood stream, allergic conditions, and those due to the involvement of cutaneous nerves or nerve ganglia; a few conditions such as nævi, new growths, verruca vulgaris, and acanthosis nigricans cannot be classified under any of these groups.

The first group includes eruptions due to pityrosporon, the pyogenic cocci, and the acne bacillus, the tubercle bacillus, and fungi such as monilia, saccharomyces, and aspergillus. If the skin becomes sensitised to one of these organisms it is possible to confirm the diagnosis by intradermal injection of an emulsion of the causative organism, both a local and a focal reaction developing in the course of a few days. Infection with pityrosporon produces first a seborrhœic dermatitis which passes on to eczematisation and to secondary infection, usually with *Staphylococcus aureus* or *Streptococcus longus*. The treatment, Dr. Barber considers, should include the infected scalp; a campaign against the uncleanliness of hairdressers might help to reduce the incidence. The acne bacillus gives rise to comedos and pustules in the meatus, and staphylococcal infections to boils and eczema. Streptococcal infections once acquired are extremely persistent and characterised by fissure formation in the folds of the skin; the angle of the retro-auricular fold appears to be a favourite site. The adoption of a parasitic mode of life by these organisms was favoured, Dr. Barber said, by a seborrhœic condition of the skin, particularly in the cases of pityrosporon, the staphylococci, and the acne bacillus. Moisture favoured the growth of monilia, infection with which was common on the fingers of washerwomen and barmen whose hands were continually wet. Where the resistance of the epidermis had failed, especially against invasion with streptococci, the production of antibodies could be stimulated by the intradermal injection of graded doses of a vaccine made from the causative organism. When a local reaction to this treatment ceased to occur it was usually found that the resistance of the skin had conquered the infection.

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[1] Stillbirth and Neonatal Death in India: A Preliminary Enquiry. London: H. K. Lewis and Co. Pp. 165. 1s. 6d.

Mr. T. B. Layton believes that moisture predisposes so strongly to the infection of the meatus that he has abandoned the use of watery ear drops for middle-ear suppuration in favour of applications made up with spirit or glycerin. He considers that treatment is carried out more effectively if undertaken by the patient himself, and finds that children as young as 6 years of age can become expert in mopping out their own ears. His view that watery applications should be abandoned was shared by Mr. E. Watson-Williams, but Mr. L. Graham Brown considers that syringing is invaluable for removing debris, after which applications of glycerin or spirit can be used with more hope of success.

CORONARY THROMBOSIS.

DURING the past few years many papers on coronary thrombosis have appeared in the English and American journals. The clinical features of the syndrome are now well recognised, and it is only in atypical cases and in those in which the symptoms are short-lived that any difficulty arises in the diagnosis. Eight such cases are described by Dr. R. L. Levy in a recent paper[1] which constitutes an important contribution to the subject. All the patients were under 50 years of age, and two of them were only 37. In five there was a family history of heart disease, terminating in sudden death. This is an important point from the aspect both of diagnosis and prognosis. Most cardiologists know of families in which two or more members have died suddenly, sometimes in what appears to have been their first cardiac seizure. The term diathesis is no longer fashionable, but this is one instance in which it might aptly be applied, for a known family tendency to coronary disease must always carry much weight in prognosis, even where the symptoms appear to be relatively trivial. Levy noted the excessive use of tobacco in six of his eight patients. It has been suggested by previous writers that tobacco may be an accessory factor in the causation of coronary degeneration; but this thesis is exceedingly difficult to prove, and it must be admitted that at present it is purely speculative. Excessive smoking, especially in women, is often one manifestation of a somewhat highly strung and restless temperament, and it may be that it is not the tobacco but rather the habit of living at top speed which puts an undue strain on the arterial system and induces premature degenerative changes. All Levy's cases were in people who were working under high pressure.

The diagnosis in these atypical and apparently mild cases must be based on the character and distribution of the pain, the associated febrile disturbance, the leucocytosis, and the electrocardiographic changes. As in the more severe cases the attack is generally followed by a pronounced fall in blood pressure. The most surprising feature in Levy's cases was the rapidity with which the patients recovered. In several instances they felt quite well and insisted on resuming their normal activities within a few days of the attack. One of these patients died in a second attack four years later, and two others had further attacks within 12 months. Syphilis was not a factor in any of Levy's cases, but infections of various types—e.g., sinusitis and colitis—constituted a notable feature in the histories. Of the seven surviving patients, two appear to have made a complete recovery, while in the other five the cardiac reserve is definitely impaired.

VIEWS ON SPINAL ANALGESIA.

IN the *American Journal of Surgery* for March are nine papers on spinal and other modern forms of anæsthesia, and they contain some remarkably dogmatic statements. We do not deny that most of these are logically upheld by their context, but at first sight they are somewhat startling. Meyer Saklad, discussing spinal analgesia, says that the low pulse-rate is the saving factor, that controllable agents are of no advantage, that ephedrine by its cardiac acceleration "places the patient in a condition closer to circulatory exhaustion," and that "intravenous infusion, unless indicated by loss of fluid out of the circulatory system, is of no value and may result injuriously." Gaston Labat, whose experience of spinal analgesia entitles his words to respect, says that "if a patient receives a spinal anæsthetic and is placed immediately in the Trendelenburg position, and if that position is maintained during the entire operation, the transfer of the patient from the table to the bed and for three hours at least after the patient has been placed in bed, I see no reason why death should occur." He stated that so far he had had no fatality and had used the method in many bad surgical risks. F. T. Romberger has sought to increase the benefits of percaine by giving it in combination with novocain, so that the latter, which acts quickly, can counteract the disadvantage which percaine possesses of taking some time to be effective. Moreover, the combined solution is heavier than simple percaine solutions, and it is therefore unnecessary to put the patient prone in order to get the posterior roots soaked. Romberger writes on the experience of a small series of cases only, but is so far well pleased with the method.

VALUE OF SERUM IN DIPHTHERIA.

A PAPER whose title will appeal both to the epidemiologist and the clinician has been published by Ida Mary Stevens[1] based on investigations at the Johns Hopkins University and with the California State board of health. In answer to 4694 inquiries issued, histories of 3122 diphtheria patients were obtained, each including the patient's age, the date of onset of the illness, the date of the doctor's first visit, the reasons for delay, the date on which antitoxin was administered, the number of units of antitoxin given, the method of administration, the number of doses, the laboratory findings, and the issue of the case. The information furnished by these histories suggested studies of: (1) the effect of delay in administering antitoxin on the case-fatality-rate; (2) the variations in the case-fatality-rate in communities of different sizes; and (3) the variations in the case-fatality-rates among different age-groups. As was to be expected, the evidence in favour of early administration of antitoxin was plentiful. In the first place comparison of the death expectancies of each day's survival in a series of cases from Providence, R.I., in the pre-antitoxin era with the California group showed that the chances of recovery were much greater to-day in the early stages of the disease, though more patients seemed to die in convalescence. Secondly, a comparison of the percentage distribution of deaths for these two periods showed that in the California series a smaller proportion of deaths occurred in the earlier stages of the illness. Thirdly, a classification of the cases according to delay in treatment showed that the greater the delay the higher were the fatality-rates and the greater the number of deaths. Fourthly, a comparison of the death expectancies for groups treated for the first time on each successive day with the death expectancies in the Providence series showed that after the fifth day the chances of death were approximately the same for both groups and that treatment delayed till then had little if any therapeutic value. As regards the differences in the fatality-rates for communities of different sizes the highest rates were found in the rural territory for all ages under 20 and for all methods of treatment, including the size or number of doses, routes of injection, and dates of injection. Finally, as regards the differences in the fatality-rates among the different age-groups it clearly emerged that except for infants under 1 year treated within the first 48 hours, the younger the child the higher was the death expectancy regardless of the size of the dose, method of administration, or delay in treatment. It will be seen from this summary that the paper, though it does credit to the writer's industry, does not convey much new information. The suggestion that antitoxin is of no value in diphtheria after the fifth day, though frequently repeated, especially in textbooks, is not borne out by practical experience. It is advisable to regard the presence of membrane in the throat, nose, or elsewhere—however late in the disease—as an indication for serotherapy.

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[1] Arch. Intern. Med., 1931, xlvii., 1.

[1] An Analysis of 3122 Diphtheria Case Histories, Amer. Jour. Hyg., March, 1931, p. 392.

ENDOCRINE REMEDIES IN SKIN DISEASE.

A QUESTIONAIRE[1] on the use of hormones in dermatology has elicited replies from six authorities in Germany, Italy, and Russia. It can be accepted that in so far as we lack reliable tests for endocrine deficiencies, and means of accurately standardising the products of the manufacturing chemist, our advances must be slow and must be based on the results of clinical trial. These are notoriously meagre. In no other department of medicine, perhaps, is the physician so often confounded and the patient disappointed. We can hardly wonder then that an enumeration of their few successful cases forms the major portion of the replies to this inquiry. Thus E. Bizzozero (Turin) reports two cases of inveterate psoriasis which eventually cleared up on a prolonged course of ovarian and thyroid injections, and the same result in a similar case associated with arthritis—on thyroid and testicular extracts. P. L. Bosellini (Rome) emphasises the extreme complexity of the problem in most cases of suspected endocrine dysfunction, excepting those in which the classical symptoms of, for example, myxœdema or Addison's disease are present. Even when the dermatologist establishes his suspicion he must remain in doubt which gland or glands are at fault, and he has always to remember that the failure of one secretion may involve a partial or complete disorganisation in the output of others. Even then his difficulties are not ended, for he has still to theorise on the nature of the dysfunction—whether it is temporary and functional, congenital and permanent, or brought about by some chronic inflammatory or malignant changes in the gland parenchyma. Examples of such difficulties are legion. Pigmentary changes, for instance, may be engendered by disturbances of the hypophysis cerebri, the suprarenals, the thyroid, or the genital glands; and it may be stated broadly that a pluriglandular dysfunction may lead either to excessive or reduced pigmentation of the skin. Finally, it has to be borne in mind that with few exceptions such as adrenalin, insulin, and thyroxin, the endocrine extracts we administer are highly complex, and have no standardised or even ascertained composition. Some of them, moreover, contain biologically antagonistic substances.

Prof. A. Buschke (Berlin) whose work on thallium acetate made its therapeutic use an accepted practice, has employed this drug in alopecia areata, which had defied all other measures, to produce complete temporary depilation. On regrowth of the hair it was found that previously denuded areas of alopecia had recovered. A similar success is claimed in a case of monilethrix, an infection peculiarly resistant to treatment. It is held by Buschke and others that thallium acetate acts by way of the endocrine glands, although the biochemical mechanism is far from clear. Irradiation of the thyroid gland with X rays is sometimes followed by at least temporary cure of psoriasis, and Buschke has found an ovarian product occasionally successful in cases of dermatitis herpetiformis and a pituitary preparation worth a trial in inveterate cases of urticaria. Thyroid should always be used in cases of sclerœdema, but its effects are more uncertain in scleroderma. All dermatoses associated with diabetes are benefited by insulin, and some successful results are reported in essential pruritus, even in the absence of hyperglycæmia.

The possibility of acquired or congenital luetic infection of the endocrine system should always be borne in mind, although it is probably not so common as French writers would have us believe. A. P. Jordan (Moscow) reports one strikingly successful case of prurigo treated by ovarian substance. The patient developed the symptom after double oöphorectomy and complete hysterectomy. The prurigo always returned when the drug was withdrawn and was immediately relieved on its resumption. The endocrine ætiology of this case seems to be clearly proved, but such cases are so rare as to be relatively unimportant. We shall all agree with R. von den Velden (Berlin) that we cannot be too careful in drawing general conclusions from isolated clinical reports.

MENTAL ILLNESS IN TWINS.

No more fundamental or momentous question has ever exercised the mind of man than that of the relative importance of environment as against heredity in shaping individual and racial destinies. As if she sympathised with our very natural perplexity on this subject, Nature now and then performs an experiment in genetics from which we can learn much. She produces uniovular twins. Such twins, being derived from the same zygote, have the same genetic constitution; hence the measure of their differences is the measure of the power of environment to modify hereditary type. The study of uniovular twins was the subject of an address entitled Genetic Problems in Psychiatry, given by Dr. A. J. Lewis at a member's meeting of the Eugenics Society in the Linnean Society's rooms on April 28th. There is, he said, no sphere of medicine in which ætiological significance of heredity has been more disputed than psychiatry. Thus estimates of the relative incidence of primary and secondary amentia vary within wide limits; psycho-analytic theory has, in recent years, undergone significant modifications in regard to the weight it gives to hereditary factors as causal agents in the various neuroses; and in the sphere of the psychoses there are profound divergencies of opinion as to the ætiological value of acquired toxæmias and endocrine disturbances. Hence in no branch of medicine would a knowledge of the principles of heredity be more useful than in psychiatry. Unfortunately, there is no branch in which the investigation of these principles is more difficult. Three such difficulties were pointed out by Dr. Lewis. There is no constant and recognisable relation between mental abnormality and bodily structure, which last can only admit of truly impersonal determination; psychiatry does not deal in unitary and circumscribed diseases, but rather in fluid syndromes, indefinite symptom-complexes, and unstable reaction types that frequently merge into and succeed one another; lastly, there is not yet complete agreement as to what should be included within the scope of a given diagnostic label. Of what, then, it may be asked, are we seeking to ascertain the inheritance? To this question the study of uniovular twins presents the most satisfactory available reply. The more unlike the environment in which two such twins have been reared, the more convincingly will be the similarity of any disease picture which they subsequently exhibit in common prove the hereditary nature of this disease. A common genetic denominator will have been demonstrated which, in the sphere of psychiatry can, perhaps alone, be rightly called unitary. Dr. Lewis is at present conducting an investigation of twins in the mental hospitals of Great Britain. He concluded a valuable and stimulating address by an appeal for assistance from any of his audience who might know of a twin or twins who had suffered or was suffering from any form of mental illness. This appeal we are happy to hand on to a wider circle.[1]

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[1] Dermat. Woch., Feb. 7th, p. 210.

AN INFANT WELFARE JUBILEE.

ON March 24th, 1906, Mrs. Arthur Luff arrived at the St. Marylebone General Dispensary with the first baby for a welfare consultation, and last week the Mayor of St. Marylebone, the Parliamentary Secretary to the Ministry of Health and other distinguished people assembled there to celebrate the little jubilee of this event. Dr. Eric Pritchard, who has established an indisputable claim for priority to this first infant welfare consultation, told the meeting what it was that put into his head the idea of starting it. He was then senior physician to the Dispensary, and was also pædiatric correspondent of THE LANCET. In this capacity he had become acquainted with the work of Pierre Budin and his system of *gouttes de lait* at the Clinique Tarnier; he had learnt of the school for mothers at Ghent; of the babies' welfare opened by Miss Margaret Boileau at Wakefield; of Mr. Benjamin Broadbent's scheme to encourage mothercraft and breast-feeding in Huddersfield; he had knowledge of the Nathan Straus pasteurisation of milk in New York City, of the Walker-Gordon system in London, and of the milk depôts in St. Helens, Liverpool, Battersea, and Finchley. These ideas crystallised into a scheme to suit conditions in St. Marylebone which appealed to the management of the Dispensary and to the St. Marylebone Health Society lately founded. Dr. Pritchard was happy in his comrades. Dr. Janet Lane-Claypon was his first clinical assistant. Dr. Stuart (now Lady) Robertson helped him for several years. Dr. Wynter Blyth was medical officer of health for the borough. Dr. E. B. Hulbert, resident medical officer at the Dispensary, was in Dr. Pritchard's words the finest sanitary policeman known in the history of St. Marylebone, the only individual who ever succeeded in opening a Harley Street window. With the help of these and others whom he named, an army of voluntary health visitors was enrolled, many of whom were fitted for service by possessing a nurse's training. There was naturally at first some little difficulty in inducing the mothers to bring their babies for inspection. It took time to accustom them to the idea of submitting their infants to a medical examination when they appeared to be perfectly well, but these difficulties were surmounted, and the St. Marylebone example proved rapidly infectious. In the following year Dr. J. F. J. Sykes started a school for mothers in St. Pancras, and there are now over 2900 welfare centres in England, Wales, and Scotland. Miss Susan Lawrence in her address spoke of the widening scope of child welfare work to include the supervision of pregnant women, of the child between 1 and 5 years of age, and of the early manifestations of rheumatic infection. It was to be hoped, she said, that the example of the St. Marylebone Dispensary would be followed in this as it had been followed in the pioneer days of infant welfare centres.

A knighthood in the Royal Victorian Order has been conferred on Mr. Henry Martyn, F.R.C.S., Surgeon Apothecary to H.M. Household at Windsor. Mr. Martyn is surgeon in charge of the ear, nose, and throat department of the King Edward VII. Hospital, Windsor. He has been attending the King during his recent indisposition.

AT a meeting of the British College of Obstetricians and Gynæcologists, reported in our news columns, it was announced that Lord Riddell has offered to give the College £600 a year for seven years. Lord Riddell has previously made a gift of £1000.

WE regret to record the death of Dr. H. B. Weir, pathologist to the National Hospital for Diseases of the Heart.

As already announced in these columns the Royal Institute of Public Health is holding its annual congress this year from May 19th to 24th at Frankfurt a.M., under the presidency of Lord Reading. The work of the congress will be conducted in six sections, and visits will be paid to centres in and around Frankfurt and in the Rhine country. The address of the Institute is 37, Russell-square, London, W.C.1, and the meeting is open to all interested in public health.

DONATIONS AND BEQUESTS.—Lady Houston has given £5000 to the Appeal Fund of the National Council for Maternity and Child Welfare.—Subject to his widow's interest, the late Mr. W. Rhodes, of Weeton, Yorks, left, among other bequests, £2000 to Harrogate Infirmary; £1000 to Leeds Maternity Hospital; and the residue of the property to Leeds General Infirmary.—The late Mr. E. R. Jaeger, of Birmingham, left £1500 to the Children's Hospital, Birmingham, and £1500 to the Royal Cripples' Hospital, Birmingham, for the endowment of "Ernst Jaeger" beds, and £2000 to the German Hospital, London.

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[1] Dr. Lewis may be addressed at the Maudsley Hospital, Denmark Hill, London, S.E.5.

SPECIAL ARTICLES

IMMUNITY IN VIRUS DISEASES.*

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II.

The available methods for producing active immunity against viruses may be considered under three heads: (*a*) immunisation with living virus, whether attenuated or not; (*b*) combined use of virus and immune serum; (*c*) immunisation with apparently killed virus.

Methods of Immunisation with Living Virus

may be grouped under the headings in Table II.

Table II.—*Methods of Immunisation with Living Virus.*

(1) Subinfective doses.
(2) Unusual route of inoculation—
    Poliomyelitis; Borna disease; herpes simplex; rabies; variola.
(3) Virus attenuated—
    By passage through usual host—variola.
    By culture—pleuro-pneumonia of cattle.
    By passage through unusual host—vaccinia and animal poxes; fowl-pox; rabies.

(1) SUBINFECTIVE DOSES.

It might seem to be a good plan to give a very small dose of living virus in hopes of giving a very mild disease which would be followed by an immunity. In practice this hardly ever works. One seems either to give so little virus that nothing happens at all either in the way of infection or of immunisation, or else the little dose of virus starts to multiply and one obtains the full-blown disease.

(2) UNUSUAL ROUTES OF INOCULATION.

Attempts have been made to immunise by giving living virus by an unusual route. This has met with a little success with some of the highly neurotropic viruses. Monkeys can be immunised against poliomyelitis by giving the virus intradermally; but the method is not always successful, and it is at present of no practical value. Borna disease is an acute encephalomyelitis affecting horses; small animals can be infected experimentally; and the virus is highly neurotropic. Here it is possible to give some immunity by injecting the virus subcutaneously, intramuscularly, or intravenously instead of directly into the nervous system. Again, the result is uncertain. Such success as there is is perhaps due to the fact that the disease has a very long incubation period, so that a general immunity can develop before the virus has propagated too much in the nervous system.

With some strains of herpes simplex virus it is possible to immunise rabbits by subcutaneous inoculations; they will then resist an intracerebral test dose which is fatal to controls. Similarly, rabbits may be rendered immune to rabies fixed virus in a fair proportion of trials by subcutaneous immunisation.

(3) ATTENUATED VIRUS.

Before the days of vaccination—in the East almost from the dawn of history—it has been sought to immunise against small-pox by variolation—that is, by deliberate inoculation with a small amount of material from a case of the disease. The method sometimes led to the occurrence of fully virulent small-pox, but as a rule the disease was milder than that naturally acquired. This was due in part perhaps to the introduction of virus directly into the skin, that is by an unusual route, as discussed in the last paragraph; in part to the propagation of pure virus unmixed with the streptococci which often accompany it; in part to the selection of mild cases for the transfer of material. Probably the actual attenuation of the virus was very slight.

The virus of pleuro-pneumonia of cattle becomes attenuated on keeping and can be used for producing immunity. This virus is of some interest as it is practically the only virus which has hitherto been cultivated in a cell-free medium. Many people because of this deny that it is a virus; but it seems hardly justifiable to do this unless you are going to exclude every organism from the category of viruses as soon as it becomes possible to cultivate it. The cultures, after a certain number of subcultures, will no longer produce the typical disease on inoculation into cattle, but they will continue to give rise to an acute local reaction following which the animal is immune to pleuro-pneumonia. This instance encourages us to hope that immunisation against other viruses would be much easier if only we could grow them on cell-free culture media.

The method of prophylactic immunisation by means of virus modified by animal passage has found very little application except in the group of animal poxes—very probably because it has not been found easy to modify other viruses in such a way that they will not readily revert to their original condition. Apart from variola and cow-pox, there are sheep-pox, goat-pox, swine-pox, horse-pox, camel-pox, and fowl-pox. The literature is full of contradictions as to whether the members of this group are convertible one into another, and whether they will immunise one against the other. It seems probable, however, that fowl-pox is separate and the others very closely related in the sense of being modifications of one virus. Inoculation of any of the group into the rabbit tends after passage to give a disease like vaccinia, which is perhaps to be regarded as the basal, least elaborated member of the group. At any rate it seems clear that vaccinia never tends to undergo the reverse modification into small-pox; this suggests that variola loses something when it is passed through the calf or rabbit, something it cannot regain. Cow-pox differs from the other poxes in having but little tendency to produce a generalised rash. Apart from its use in prophylaxis against variola, vaccinia has been used successfully to immunise pigs against swine-pox. Immunisation of poultry against fowl-pox can be carried out with pigeon-pox virus, which is probably very closely related to it.

Immunisation against rabies differs from the other kinds of immunisation we have to consider in that it is immunisation after infection. Such immunisation after infection is also possible with vaccinia; inoculated vaccinia has a much shorter incubation period than naturally acquired variola and may thus succeed in immunising a person if given after his exposure to a case of small-pox. With rabies there is a larger margin of safety, as the disease has a very long incubation period while the virus is travelling up the nerves from the site of inoculation to the central nervous system. Immunisation is made possible by the fact that the naturally occurring "street virus" in the mad dog, when passed through rabbits, undergoes a modification into so-called "fixed virus." This kills rabbits far more quickly than does street virus, but when given subcutaneously is practically harmless for man or dog. If begun early enough, intensive inoculation of this modified virus will immunise a man infected with street virus before that virus can reach his brain and kill him. Pasteur's method of attenuating the fixed virus by drying apparently acts, not by producing any qualitative change in its properties, but simply by reducing the number of living virus particles. It is possible to use dilution as a means of graduating the dose instead of the classical method of giving rabbit cords dried for shorter and shorter periods. In the East, virus inactivated by phenol is used very widely; this will be referred to later under the heading of immunisation by apparently killed viruses.

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* Two lectures (abridged), delivered at University College Hospital Medical School on March 17th and 24th, 1931.

Combined Use of Virus and Serum.

By the combined use of serum and virus one aims at producing a very mild disease which shall be followed by solid immunity. We have seen that giving very small doses of live virus is not a method which can be relied upon to give a very mild infection; immune serum, on the other hand, has considerable powers of keeping a diseased process under control.

If you mix virus with immune serum and, if necessary, incubate the mixture until it is no longer infective *by any route*, you will find that it is no good at all as an immunising agent in any virus disease. To produce immunity along these lines you must use a slightly under-neutralised mixture. This method is used in France to immunise sheep against sheep-pox. (See Table III.)

TABLE III.—*Immunisation by Combined Use of Virus and Serum.*

(1) Virus-serum mixtures—sheep-pox.
(2) Simultaneous side-to-side inoculation.
  Cattle plague.
  Swine fever.
  African horse sickness.
  Blue tongue (sheep).
  Dog distemper.*
  Yellow fever.
(3) Virus first: serum later.
  Measles.
  Dog distemper.*

* An account of this method of producing immunity to distemper by P. P. Laidlaw and G. W. Dunkin will be appearing shortly in the Jour. of Comp. Path. and Therap. They have kindly allowed me to refer to it here.

Much commoner is the "simultaneous side-to-side inoculation" of virus and immune serum into different parts of the same animal. This allows the production of a very mild form of disease. It is necessary, however, with some viruses to grade the dose of virus and serum very carefully so that the disease is just mild enough and not completely extinguished; with distemper and cattle plague an excess of immune serum seems to be immaterial. In Table III. are shown some of the diseases in which the simultaneous side-to-side method is used. Against cattle-plague and swine-fever it is employed abroad on a very large scale. The history of its origin in the prophylaxis of swine-fever is of interest. It was found that pigs passively immunised by serum were apparently permanently immune, and investigations indicated that such pigs must have come into contact with the virus while they were in a state of partial immunity; they then developed a mild unrecognised infection which left them with a solid active immunity. Now this state of affairs is deliberately brought about by simultaneous inoculation.

It may be asked, why, if this method is so successful in controlling certain virus diseases of livestock, is it not more used against the viruses attacking man, such as the specific fevers of childhood. The answer is that the farmer who uses this method of prophylaxis is prepared to lose a certain small number of his inoculated animals, but he realises that the loss will be very small compared with his probable loss if no inoculation is done. Obviously we cannot use such a method for the widespread immunisation of children until it can be controlled with some certainty, until we can be sure that when properly inoculated none will develop the disease as a result of the immunisation. One difficulty is that in many instances we could not titrate either the virus or the serum on a susceptible animal, and should be working blindfold; even measles does not "take" in monkeys with any certainty.

SERUM AFTER VIRUS.

It may happen that a serum is so effective that it can completely stop the disease from developing at all when it is given along with the virus. In order to obtain an active immunity it may be necessary to give virus first and serum a little later. This method of immunising is obviously only applicable where a disease has a long incubation period. Consider measles. An immune serum of considerable potency in passively immunising against measles can be obtained from convalescent patients. In some places adults who develop measles in institutions are systematically bled when the temperature has returned to normal; the sera after Wassermann testing are pooled and are then available for use. It is, however, possible to obtain serum from normal adults who are known to have had measles; such sera are poorer in antibodies than convalescent sera, but are quite as effective if given in correspondingly larger doses. If measles contacts are immediately injected with 5 c.cm. of convalescent human serum they will mostly be protected, but they will not develop any active immunity. Some will develop a very mild disease and will be actively immune. If the serum is given a few days after exposure to infection, but not later than the middle of the incubation period, a mild disease will usually result and active immunity follow. Instead of giving 5 c.cm. of convalescent serum one may give larger quantities of normal adult serum; it is not so potent, but much easier to get hold of at a moment's notice. For reasons already discussed it is not practicable to immunise children systematically along these lines. All the same if the eldest member of a family brought back measles from school, it would be very reasonable to allow the younger ones to come into full contact with him and to give them some of your own blood intramuscularly (if you had had measles) after four days in the hopes that they would have a very mild infection. Of course, if the younger children were weakly one would prefer to give serum or blood as soon as possible, hoping to avoid the disease altogether for the time.

Immunisation with Apparently Killed Virus.

We now come to a point of much practical and theoretical importance: can one immunise with killed virus? It would obviously be of enormous importance to be able to immunise animals regularly with no risk of losing *any* of those inoculated, and to have a method which could safely be applied to immunising human beings. Everyone agrees that it is possible to immunise against many virus diseases with apparently killed virus, and that the immunity obtained is feeble compared with the immunity produced by live virus. So far we are on safe ground. What is greatly disputed is whether the apparently killed virus is really killed, or whether it contains living virus in very small quantity or modified in some way. Table IV. shows some of the diseases against which apparently dead virus can produce immunity and also the agents which have been used for inactivation. In not every instance have such vaccines been applied practically. The list is incomplete, but even so I have included some examples because of their theoretical interest, although they rest on isolated unconfirmed observations. Some points in the Table require further comment. First, none of these methods has as yet been applied practically to the immunisation of man. Only three human diseases appear in the list, and the experiments on yellow fever and poliomyelitis concern monkeys and are only in the very early preliminary stages.

TABLE IV.—*Immunisation by Apparently Killed Viruses.*

Agent use for inactivation.	Viruses.
Formalin	Foot-and-mouth disease ; distemper* ; cattle plague* ; yellow fever ; African horse sickness.*
Phenol and phenol-glycerin	Rabies* ; distemper ; fowl plague ; cattle plague* ; Borna disease ; yellow fever.
" Autolysis " ..	Cattle plague ; foot-and-mouth disease.
Bile	Dengue.
Chloroform	Cattle plague.*
Ether	Rabies.*
Aluminium hydroxide	Poliomyelitis.
Heat	Distemper ; fowl-pox.*

The vaccines marked with an asterisk have been used, apparently with success, in the field.

Second, some viruses, particularly cattle plague, can be made into a vaccine fairly easily, and a number of different methods seem to work. Even virus allowed to die off of its own accord in saline (" autolysis " in the Table) is said to immunise. On the other hand, other viruses, such as vaccinia, do not appear in the list; there is no agreement as to whether inactivated vaccinia will immunise at all.

The phenolised rabies virus is used on a large scale —almost entirely replacing living virus in the East for the treatment of bitten persons. It is used extensively in Japan, and also in Europe and America, as a true prophylactic for widespread immunisation of dogs. This is an obviously very advantageous method to have available in a country where rabies is widespread and where quarantine measures are not practicable as they are in England.

Formalinised virus has been found not to give a very durable immunity against dog distemper. It is therefore recommended that one dose of this vaccine should be given to dogs and that this should be followed up later by a dose of living virus. This dose of living virus may or may not be followed by a mild febrile reaction ; but it succeeds in converting the slight transient immunity which the dead vaccine confers into a solid lasting one.

Horse-sickness virus is not inactivated by a weaker dose of formalin than 1 : 1000. Vaccine made with 1 : 1000 formalin will not protect horses against living virus. But workers in South Africa have found it possible to protect by means of 1 : 1000 formalin against virus treated with 1 : 2000 formalin and then to follow up with virus treated with 1 : 3000 and 1 : 4000 formalin. Finally, living virus can be given with safety. If it should prove that the doses of partly inactivated virus do not simply represent minute doses of living virus, a very interesting field of speculation would be open. A similar story is told by some workers in Greece concerning immunisation against dengue by means of bile-treated virus. Virus completely killed by bile failed to immunise against living virus, but immunity could be established by giving doses of virus treated with successively weaker and weaker concentrations of bile.

ARE THESE VACCINES DEAD ?

Very large doses of, let us say, formalinised distemper virus fail to infect a dog. Why then, it may be asked, should some people still deny the possibility of immunising with killed viruses ? They do so because of a number of difficulties and anomalies which exist.

METHODS OF " KILLING " VIRUS.

One reagent will make a good vaccine from one virus ; quite a different one works with another virus ; it is difficult to lay down rules. Heat seems a bad method to use ; formalin is perhaps the most generally useful. It seems best to inactivate your virus slowly, using a concentration of reagent which will not inactivate for some time ; a similar principle applies to the making of anatoxin from toxin. As with toxin and anatoxin, too, one has to work within a fairly narrow range of formalin concentration. Too strong formalin will destroy all antigenic power ; too weak formalin will not completely inactivate. This is one of the facts which leads some to suspect that an effective vaccine may be not entirely " dead."

QUANTITY OF VIRUS INJECTED.

Toxin and anatoxin may not differ much in immunising value, but inactivated virus is enormously weaker than living virus. This is doubtless largely because the " killed " vaccine contains such a minute trace of antigenic virus protein, while the living virus can multiply perhaps a millionfold in the body and thus has a far better chance of immunising. Here, again, some think it hardly conceivable that the trace of virus in a " killed " vaccine can possibly immunise unless it can multiply to some extent. When virus is inoculated into a naturally refractory species one commonly finds that no specific neutralising antibodies develop. Virus so inoculated probably cannot multiply, and is for all intents and purposes dead. It is therefore easy to understand why it is so difficult to obtain antibodies ; such a very small amount of antigen has been introduced. It is not quite true to say that a virus cannot evoke antibodies in a non-susceptible species, for apparently horses will yield an anti-poliomyelitis serum. On the whole, however, it is a difficult thing to do. A complication is, of course, introduced by the fact that a horse immunised with poliomyelitis virus is receiving in addition to a tiny dose of virus a good deal of monkey protein, since infected monkey brain or cord is the only source of poliomyelitis virus available.

SPECIES OF ANIMAL FURNISHING VIRUS.

This same difficulty is seen in another connexion. Laidlaw and Dunkin proved that dog distemper virus would infect ferrets, and that these were in some ways very convenient to work with. A formalinised vaccine made from dog tissue gave protection to dogs, but was little use for immunising ferrets ; the same was true when ferret tissue was used to immunise dogs. A possible, but not proved explanation was this : the immunity mechanism of a dog injected with formalinised ferret spleen might be so busily occupied in making antibodies to the foreign ferret protein that it would, as it were, overlook the insignificant trifle of virus that was *there* and fail to make antibodies to that.

Similarly, cattle plague vaccine made from cattle tissue seems to be of no value in immunising goats. Here we have a difficulty of great practical importance. A formalinised virus has been found to give some immunity to yellow fever in monkeys; but as yet it has not proved to have any value in immunising man. It may be that the dog-ferret complication comes in here again; the human immunity mechanism may not respond well to virus contained in monkey tissue. If it is found impossible to immunise man against "killed" human viruses unless these are contained in human tissue, our progress will be considerably slowed up. We shall have to redouble our efforts to grow viruses on artificial media or else to purify them and get them separated from the animal proteins from which they cannot at present be freed. The difficulty I have outlined may not, however, occur universally, for it seems that rabies fixed virus which has been inactivated with phenol will immunise both man and the dog, though it is made from rabbit tissue.

TISSUE USED AS SOURCE OF VACCINE.

The last anomaly concerns the choice of tissue from which to make a vaccine. In cattle plague and in fowl plague blood is found to be extremely rich in virus, yet blood treated with formalin or phenol fails to make a good antigen. One has to use tissue, and in many diseases liver, spleen, and lymph glands seem to be best, though, of course, with a disease like rabies one naturally takes the tissue where the virus is present—the brain and cord. Why it is necessary to use tissue and not blood we do not know.

The enumeration of these complications seems to show that the story is by no means a simple one. In spite of the anomalies it appears to me most probable that it is really possible to immunise with virus which is quite dead; but at present it seems wise to reserve judgment. The analogy with the inactivation of toxins by agents such as formalin is, of course, very striking, but it is worth bearing in mind that the toxin-toxoid reaction is apparently a reversible one; it is just conceivable that the inactivation of a virus also might be reversible within the body.

To conclude, much progress has been made in active immunisation of the virus diseases of animals, but we do not seem to have advanced as rapidly in achieving *specific prophylaxis against the viruses* attacking man. There are, however, many indications of the lines along which further advances may be sought.

The field covered has been so wide that a bibliography to be complete would be of inordinate length. I have therefore deliberately omitted names and references. Most of the matter referred to may be found in the seventh volume of the Medical Research Council's "System of Bacteriology."

ST. BARTHOLOMEW'S HOSPITAL.—The income last year of this hospital was £216,305, an increase of £17,768; the expenditure was £219,138, an increase of £21,469. The annual report states that the completion of the surgical block marks the second stage in the scheme of reconstruction. The next stage should be the erection of a medical block to replace the south block which is nearly 200 years old and is no longer adequate. Equally urgent needs are the provision of additional accommodation for maternity patients and of a paying patients' department.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

WHEN SHOULD ANTI-TETANUS SERUM BE GIVEN?

I HAVE already referred to the need felt in France of an authoritative pronouncement on the conditions under which anti-tetanus serum should or should not be given. The commission appointed to report to the Académie de Médecine on this matter was composed of Roux, Vaillard, Bazy, Walther, Hartmann, Balthazard, Faure, Dopter, Vallée, Mauclaire, Auvray, and Gosset. After meeting three times, this commission reported to the Academy on April 14th. At the first meeting it was agreed that each member should submit a short memorandum to the commission's "rapporteur." These memoranda, which consisted to a certain extent of summaries of our knowledge of tetanus brought up to date, contained some expressions of opinion to which all the members of the commission were willing to subscribe. It was unanimously agreed that it was impossible to insist too strongly on the necessity for cleaning and disinfecting as thoroughly as possible every wound, especially lacerated wounds, and for removing foreign bodies. Anti-tetanus serum should be given for all lacerated wounds, and for less serious wounds complicated by foreign bodies or soiled by earth. This treatment is also indicated for all wounds, however slight, of the sole of the foot, and for subungual wounds, particularly of the feet. On the other hand, serum treatment need not be undertaken for superficial wounds easy to clean, uncomplicated by foreign bodies and not soiled by earth. So much for the unanimous recommendation of the commission which was accepted by the Academy, also unanimously. Among the memoranda submitted by its members to the commission was one by Roux the gist of which was as follows: It is impossible to enumerate all the circumstances under which tetanus may arise. Several of them are so rare that a doctor cannot be blamed for not having foreseen them. It is the duty of the doctor in charge to take the initiative with regard to the use of anti-tetanus serum, and the commission does not claim to lay down hard-and-fast rules. Roux referred to the special case in which a foreign body cannot be removed at once, the surgeon having to defer its extraction to a later date. In such a case he recommended active immunisation by Ramon's tetanus anatoxin. As soon as the wound has been dressed, the first injection of anatoxin is given. A quarter of an hour later the ordinary injection of anti-tetanus serum is given at some other point, and two weeks later a second injection of anatoxin is given. After another fortnight, the third and last injection of anatoxin is given. "It is superfluous to insist on the advantages of active immunisation should war break out."

THE SCIENTIST'S PROPRIETARY INTEREST IN HIS DISCOVERIES.

This question, raised in your leading article last week, was the subject of a report to the Académie de Médecine on April 21st by Dr. Lucien Klotz, who contrasted the poverty of the scientist, of hospitals, and of scientific libraries with the enormous benefit they confer on the community. He outlined a scheme according to which the starting-point of remuneration for scientific work should be the day on which its publication appeared. The scientist would then submit a memorandum, claiming a charge on the practical applications of his discovery, based on the publication thereof. He should be able to levy this charge for 50 years. A Supreme Council of Discoveries and Scientific Inventions would have to estimate the commercial value of a discovery or invention. Dr. Klotz argued that this scheme would not dishonour the scientist and would favour the provision of hospitals, and the protection and advancement of science which, as it provides milliards, deserves millions. At the conclusion of Dr. Klotz's report Prof. de Lapersonne, President of the Academy, carried the appointment of a commission charged with the preparation of a draft of a legal statute to deal with the rights of scientific discoveries. The members of this Commission are Madame Curie and Profs. Hanriot, d'Arsonval, Sergent, Léon Bernard, and Bezançon.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

PROPAGANDA AGAINST VENEREAL DISEASES.

THE Department of Health for Scotland has issued a circular dealing with health propaganda in general and with venereal diseases propaganda in particular. In 1916 a sum of about £1000 a year was granted to the Scottish Committee of the British Social Hygiene Council. This sum was under the direct control of the Board of Health and later of the Department. But, under the Local Government (Scotland) Act, 1929, this grant forms a part of the general money subsidy to the local authorities. Under this Act the local authorities have received powers to conduct propaganda for health education on the widest scale, including propaganda on venereal diseases, and each authority is entitled to its portion of the original £1000 granted in the standard year 1928–29. For example, the county of Aberdeen received £30 11*s.* 8*d.*; the County of Zetland, £4 19*s.* 9*d.*; while of the burghs, Glasgow received £219, and Edinburgh £87. The circular suggests that, instead of spending these amounts individually, the local authorities should pool their resources and enable the Scottish Committee to conduct the same type of propaganda as it formerly did under the central authority. It will be very difficult to get all the local authorities to consent to this, but an effort is to be made. The sum of £1000 is equivalent to 4*s.* 1*d.* per 1000 of the estimated population of the districts. There is no doubt that the control of the original money by the central authority enabled the Scottish Committee to do a great deal of independent work all over Scotland. The local authorities will tend to keep their expenditure entirely within their own districts. In the prevention of venereal diseases, it would have been wise to reserve to the central authority a certain sum that could be spent as the British Social Hygiene Council have spent it.

HONOUR TO DR. A. L. S. TUKE.

Dr. Alan Leonard Smith Tuke has been made an honorary freeman of the city of Dunfermline. This honour is in recognition of his public services, especially in connexion with the Dunfermline and West Fife Hospital, and with the local ex-Service men and their families. The freedom of Dunfermline, the old capital of the Kingdom of Fife, has not been frequently conferred and the distinction is therefore all the greater. In the earlier days of his practice there, Dr. Tuke did a great deal to develop the practice of physical education at the Carnegie Institutions. He took a full share in the war, serving in the Egyptian and Palestine campaigns and won the Military Cross in 1916. Recently he has given his full energy to the raising of £50,000 for the extension of the West Fife Hospital. On receiving the freedom, Dr. Tuke was able to sketch the progress of local medical events for forty years. Dunfermline, he pointed out, was the first town in Great Britain to introduce a complete and thorough system of school medical inspection, accompanied by organised and systematic physical training.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

EFFICACY OF LEGISLATION AGAINST VENEREAL DISEASES.

Prof. L. R. von Zumbusch, of Munich, discusses in the *Ärzteblatt* the efficacy of the law against venereal diseases which has been in operation since Oct. 1st, 1927. One of the purposes of that law was, as he points out, to diminish prostitution, and this object, in his opinion, has not been attained; on the contrary many women who were formerly prostitutes in secret have now become professionals so that street prostitution has become more evident. At the same time these women have become known to the police and have been referred to the municipal health offices for treatment and supervision. They have learnt that there is profit in being able to show a certificate of health and in Munich the number regularly examined has risen from 100 to 400 a week. Another advantage is that under the new law not women only but also men can be sent to hospital by the health authority, for they are just as likely to spread venereal diseases as are the prostitutes. The new law prohibits treatment of venereal diseases by unqualified persons, and does not allow the treatment to be discussed by other than qualified medical men in journals or at meetings not purely medical. According to Prof. Zumbusch this is the first serious step taken against unqualified practice. It is stated that venereal diseases have already diminished, although trustworthy returns are not yet available for the whole German territory.

THE PRESCRIPTION OF NARCOTICS.

In accordance with the law against abuse of narcotics the government has issued regulations more severe than those hitherto in force. By these new regulations narcotics can be prescribed only by qualified medical men and when their administration is medically justified. Compounds are not to be prescribed containing more than one narcotic nor compounds containing coca leaves, or opium, heroin, dicodid, eucodal, narcophin, and similar narcotics in substance. No medicine may contain more than 15 per cent. of morphia or heroin, nor more than 2 g. of opium, 0·2 g. of morphia, 0·4 of narcophin, laudanon, or pantopon, 0·2 g. of dicodid, or eucoidal, or 0·03 of heroin or dilaudid. In special cases a medical man may exceed these quantities but he is obliged to keep a register for such cases with accurate particulars of the disease. The prescription of cocaine in substance is prohibited, but a patient may receive a 2 per cent. solution for application to an eye and a 1 per cent. solution for other purposes. For use in the consulting room a medical man may prescribe not more than 1 gramme daily. A prescription given to a patient must bear the date, directions for use, the name and address of the patient, and the signature of the medical man. Where the allotted quantity has been exceeded the medical man must indicate on the prescription that he has entered the case in his register. Pharmacies are obliged to supply medicine only if it is prescribed in accordance with the above regulations, but in urgent cases a small quantity may be provisionally given even if the prescription is not in every respect in order. Apothecaries have to keep a book for registration of the prescriptions and this must be preserved for five years. It must be sent on request to the local health authority or to the German Health Office, or shown to an authorised representative of these authorities.

PERNOCTON ANÆSTHESIA.

Dr. Baisch reports in the *Archiv für Gynäkologie* on the results of pernocton anæsthesia. He has used the method in 1200 gynæcological operations and in 900 confinements. To produce deep narcosis in laparotomies on an average not more than 40 g. of ether and 5 g. of chloroform had to be used if pernocton was administered; in other operations the amount of ether was up to 30 g. and of chloroform up to 2 g. There is no contra-indication to the use of pernocton if it is given in a suitable dosage according to body-weight and if the intravenous injection is made very slowly, taking five or ten minutes. Even in cases of cardiac or pulmonary disease, and in advanced age—the oldest of Baisch's patients being 80—the drug was applied without risk. In parturient women pernocton was given instead of scopolamine. No death occurred which could be attributed to the narcosis, and bronchitis and broncho-pneumonia were very rare. The technique of giving pernocton—in contrast to avertin—is very simple. According to Baisch every operation from the easiest to the most complicated may be executed under pernocton anæsthesia.

MEAT-POISONING IN GERMANY.

According to statistical returns published by the German Health Office 2000 cases of meat-poisoning have been reported during the past three years, of which 60 were fatal. Most of the cases were of course recorded during the hot season from May to October and were traceable especially to cattle meat. More than half of the illnesses and a third of the deaths were caused by raw meat, while 10 per cent. were due to horse meat. Of the cases caused by consumption of sausage, 41 per cent. were due to liver sausage. Food control having become more effective, meat-poisoning has shown a considerable decrease compared with former years.

CHILDREN'S NURSES.

New regulations have been issued for the training and the examination of nurses for infants. There are two categories of nurses: those for healthy infants are called Säuglings-Pflegerin, and those for the sick are called Säuglings-Schwester. The former category are destined to the general care of infants in families, orphan asylums, &c. Their training lasts a year and includes the care and the up-bringing of babies and training in domestic work. The second category are trained for two years. In the first year the training is the same as for Säuglings-Pflegerin, but in the second year they are instructed in the nursing of sick children, infectious diseases, and first aid. Women of 18 to 34 years of age are admitted to the training and to the examination. For midwives and general nurses with a recognised diploma the training as an infant's nurse may be shortened.

MEDICAL BROADCASTING.

Lectures for medical men were broadcasted some time ago and the report of the Broadcasting Company says they are very much liked by the profession. This statement is however contradicted by several medical men in the *Ärzteblatt*. They say first that the time allowed for the individual lecture is too short to be of value and that therefore they cannot be an equivalent for medical lectures and congresses as suggested by the Broadcasting Company. Another drawback is that the lectures can be heard by the general public. People who have been listening for instance to a lecture on gall-stones or on the modern treatment of diabetes insist on their medical attendants applying the methods recommended by the radio lectures. As not only the symptoms of a disease, but also the differential diagnosis, the treatment, and (worse still) the prognosis is discussed, hypochondria is liable to be encouraged. A correspondent rightly remarks that medical radio lectures are like training medical students in public places where everyone can hear things destined only for the profession.

THE SERVICES

ROYAL ARMY MEDICAL CORPS.

Capt. E. G. Dalziel, from the secd. list, is restd. to the estabt.

Temporary Commissions.—The undermentioned Capts. to be Majs.:—E. M. J. O'Farrell, H. Jacques, and E. A. Tozer.

ARMY RESERVE OF OFFICERS.

Lt. F. R. How resigns his commn.

TERRITORIAL ARMY.

Lt. J. T. McOuat, from 6th Bn. Seaforth, to be Lt.

C. A. Ferguson (late Offr. Cadet, Glasgow Univ. Contgt., Sen. Div., O.T.C.) to be Lt.

J. W. Galloway (late Cadet Lce-Corpl., George Heriot's Sch. Contgt., Jun Div., O.T.C.) to be Lt.

R. B. Brew to be Lt.

INDIAN MEDICAL SERVICE.

Lt. H. S. Waters to be Capt. (*prov.*).

ROYAL AIR FORCE.

A. S. Burns is granted a short service commission as a Flight Lieutenant for three years on the Active List.

G. Kinneir is granted a temporary commission as a Flight Lieutenant.

Dental Branch.—J. E. Tyrrell is granted a non-permanent commission as a Flying Officer.

COLONIAL MEDICAL SERVICES.

The *following* appointments have been made by the Colonial Secretary during the month of April: Dr. A. C. Edwards, Supernumerary Medical Officer, Leeward Islands; Dr. C. Sturton, West African Medical Staff, Nigeria; and Dr. J. E. Macdonald, Medical Officer, Northern Rhodesia.

BIRMINGHAM DENTAL HOSPITAL.—Before the establishment of the Birmingham Hospital's Contributory Scheme three years ago this institution received annually about 6300 new patients. Since then there has been an enormous increase, and in 1930 there were 14,093 patients. Notwithstanding the rapid growth in the work of the hospital public donations provide only £600 of an expenditure exceeding £5000 a year.

ST. HELENS MATERNITY AND CHILD WELFARE HOSPITAL.—Last week this new hospital was opened by Dr. J. J. Buchan, formerly medical officer of St. Helens and now medical officer of Bradford. The building provides for 15 maternity cases and 22 ailing and debilitated children and has cost £18,500. Dr. Buchan recalled that the milk depôt established at St. Helens more than 30 years ago was "the very first thing done in any English-speaking country by any municipality to reduce the death-rate among infants."

CORRESPONDENCE

SWEEPSTAKES AND VOLUNTARY HOSPITALS.

To the Editor of THE LANCET.

SIR,—The success of the Irish sweepstakes and the transfer of such large sums of money from this country to Ireland have naturally aroused public interest, especially in connexion with the hospitals. "Why," it is asked, "if such substantial financial assistance can be given to Irish hospitals out of the sweepstakes cannot the same help be given on a larger scale to English hospitals which are so much in need of it."

So far as this particular part of the question is concerned it can easily be answered. It is certain that no one individual hospital would be allowed to run a sweepstake for its own exclusive benefit. If permission were given to one hospital there could be no reason for refusing it to any other hospital or charity, and as there are in England and Wales nearly 1000 hospitals and about 49,000 charities of different kinds there would be such a deluge of sweepstakes as to be self-destructive, and such an intolerable nuisance that even the generous and long-suffering British public would rise in revolt.

If it be granted that sweepstakes could only be legalised on the Irish basis and given a national character, there might then be three or four large sweepstakes organised during the year, say, on the Lincoln Handicap, Grand National, Derby, and Leger. The greater part of the money received must, of course, go to the prizewinners and the hospitals could not expect to get more than 20 or 25 per cent. Suppose that this resulted in a sum of £1,000,000. This would have to be divided, as I said above, among nearly 1000 hospitals which at once takes almost all the gilt off the gingerbread so far as each individual hospital is concerned, and then there are all the other charities to be considered. They would naturally clamour for some of the cake, and the end would be that the £1,000,000 would disappear in innumerable small grants which would be of little practical use to the hospital and would undoubtedly alienate many of its existing supporters. I am told that there is already a marked falling off in subscriptions to the Irish hospitals, subscribers rather naturally taking the view that as the hospitals are getting such a large subvention from the sweepstakes, their own subscriptions are not so much needed and can be reduced or cancelled altogether.

This is the purely material side of the question. There is also the moral side, but it seems to me unnecessary to dwell on it as the answer given to the material side is so conclusive. Hospitals would quite certainly lose by "sweepstakes for hospitals," and they would doubly lose if, in the eyes of not a few people, gambling were to climb into legality on the hospitals' backs.

But I have a suggestion to make. I received a letter a few days ago from the chairman of a small and very good provincial hospital. He said that a considerable part of their income was derived from a sweepstake got up every year and managed by the working people of the district, and for which all the prizes were in kind and were given. Surely this could not be called "gambling," and no one could possibly have any real objection to these people who are already interested in the hospital helping it in this way. The same position exists in connexion with "raffles" at bazaars and similar happy hunting-grounds of charities. These, as the law stands, are illegal, and any little girl raffling the indigestible-looking cake that auntie has made, and for which she has been told to get at least ten shillings, is bringing herself within the stern grip of the law. This is, of course, quite ridiculous, and if it hasn't led to "bootlegging" it can only be because we are, in the main, a patient and law-abiding race.

My suggestion is that these sweepstakes, lotteries, or raffles, by whichever name they may be called, shall be legalised, subject to the following conditions:—

1. The prizes shall all be in kind and no prize shall be in money.
2. The prizes shall all be given and shall not be paid for out of the money taken for tickets.
3. The whole proceeds shall go to the hospital or "charity" concerned subject to a very small deduction for expenses (such as the printing of tickets, &c.).

Surely the most determined opponent of gambling could see no offence in an arrangement of this kind. The winner gets the cake very cheaply, the seller gets a much better prize than would otherwise be obtainable, the charity gets the whole of the money, and the unfortunate holders of losing tickets are not likely to grudge their threepence or sixpence going to the charity in which presumably they are already interested.

I put this forward as a serious suggestion. I believe that it would result in very considerable aggregation of small sums for the benefit of hospitals and charities, especially the smaller ones, and I do not see how it could offend even the most sensitive conscience. I am, Sir, yours faithfully,

ARTHUR STANLEY.

Treasurer's House, St. Thomas's Hospital, S.E.

To the Editor of THE LANCET.

SIR,—You ask me, as chairman of the Hospital Saving Association, whether I think it wise to raise money for voluntary hospitals by sweepstakes.

The Hospital Saving Association exists to enable those who expect some day to be treated in hospital to save their money while they are earning wages, so that, when they fall ill, they may not have to depend on charity. Our contributors open their eyes and look bravely at one of the unpleasant facts of life. They realise that they and their dependants will, in the ordinary course of nature, fall seriously ill once or twice before they die, and they join together in our Association to prepare themselves and to organise mutual support for this emergency.

Illness is not a gamble, and it would not accord with the principles on which the Hospital Saving Association appeals to its members to base the finance of healing on the unstable foundation of gambling.

I am, Sir, yours faithfully,

5, Fenchurch-avenue, London. ALAN G. ANDERSON.

To the Editor of THE LANCET.

SIR,—In reply to your letter with reference to sweepstakes for hospitals, I think it is sufficient to say that sweepstakes in this country are at present illegal. In my capacity as treasurer of St. Bartholomew's Hospital, I would not be prepared to take part in any unlawful scheme. Ergo, I would not be prepared to organise a sweepstake on behalf of the hospital. But if the Government decided to legalise sweepstakes the position would be different, and it would be my duty to consider the desirability or otherwise, from the point of view of the best interests of the hospital, of the accepting of funds raised by this means. I am, Sir, yours faithfully,

St. Bartholomew's Hospital, E.C. STANMORE.

ORTHODOXY AND HETERODOXY IN SURGERY.

To the Editor of THE LANCET.

SIR,—In the address on this subject in your issue of April 25th Mr. Ogilvie says: "those operations that aim at making an anastomosis between the stomach and duodenum are based upon unsound physiology and are unprofitable in practice." Amongst such operations he mentions gastro-duodenostomy and duodenectomy—two very different things. Of the latter I have little first-hand knowledge, but of the former I have had a considerable experience, and I can assure Mr. Ogilvie, who states that "when an anastomosis is made between them (that is, the stomach and duodenum) bleeding is troublesome at the time, and leakage is not uncommon afterwards," that so far as gastro-duodenostomy is concerned these statements are entirely contrary to my experience. I never use a clamp on the duodenum and yet bleeding is no more troublesome than it is from the jejunum when doing a gastro-jejunostomy, where again I use a clamp only on the stomach. Nor have I ever seen a case where leakage has occurred from the anastomotic line. I think bleeding from the gastro-duodenal artery might be very troublesome in doing a duodenectomy for a posterior duodenal ulcer; one has even heard of an injury to the common duct in similar circumstances; if Mr. Ogilvie is referring to this operation it would be fairer if he made a distinction between duodenectomy, which for duodenal ulcer I consider a thoroughly bad operation, and gastro-duodenostomy, which my experience leads me to put at least equal to posterior gastro-jejunostomy as an operation. I think Mr. Ogilvie would find, on inquiry, that this is the kind of opinion he would receive about gastro-duodenostomy from most surgeons in the first rank—"in those cases where I have performed gastro-duodenostomy I have been well satisfied with the results; however, I usually do posterior gastro-jejunostomy because the conditions are more often favourable for the performance of this operation." In other words, the reason why gastro-duodenostomy is not more often performed is neither that the results are inferior nor that the physiology is less sound than that of gastro-jejunostomy as Mr. Ogilvie asserts.

One of the reasons given for the advocacy of gastro-duodenostomy according to Mr. Ogilvie is that the food leaving the stomach enters that part of the small intestine which is most used, to the presence of an acid medium; this, he says, is no more than an unsupported statement. It is not, however, in my opinion, quite the right way of stating the case. If he had said that the food enters that part of the intestine, into which nature intended it should pass from the stomach, more nearly than after gastro-jejunostomy, he would perhaps agree that mixing of the digestive juices and bile with the food has a sounder physiological arrangement than is the case after gastro-jejunostomy.

The real position seems to be this—there is only one good reason why gastro-duodenostomy is not more generally done, and that is the anatomical circumstances are more often unfavourable than otherwise, though in my opinion less often so than is generally thought; the results are certainly equal to those of gastro-jejunostomy, and the physiological arrangements are less disturbed by gastro-duodenostomy than by gastro-jejunostomy (what functional value, if any, there is in this it is not easy to determine).

The aspersions cast by Mr. Ogilvie on anastomoses between the stomach and duodenum are, in my experience, quite unfounded so far as gastro-duodenostomy is concerned. Indeed, I think he is damning an operation which has won for itself quite an honourable position in the treatment of certain cases of duodenal ulcer.

I am, Sir, yours faithfully,

Leeds, April 30th, 1931. E. R. FLINT.

INSULIN AND PRESERVATIVE.

To the Editor of THE LANCET.

SIR,—The doubts of Dr. Leyton and Dr. Poulton, as to whether the addition of antiseptic to insulin solutions would be a benefit, must be shared by the vast majority of physicians having long practical experience of the use of this substance. I can myself state that I have never come across any sign of ill-effect due to the absence of antiseptics in the solutions which have been in use up to the present time. It is perhaps doubtful whether the introduction of such substances could have any ill-effect, but it seems almost certain that no good can thereby be brought about, and it is also worthy of note that some manufacturers, advised by scientific experts of the highest authority, have such strong objection to the suggested change that the particular brands of insulin made by them may, in such circumstances, be withdrawn from the market. This alone would be most regrettable.

It is to be hoped the Ministry of Health will not proceed with the contemplated Bill until an opportunity has been given to all shades of medical opinion to express views as to the wisdom of the proposed measure. I am, Sir, yours faithfully,

London, W., May 2nd, 1931. T. IZOD BENNETT.

CAVERNOUS SINUS THROMBOSIS AND FACIAL INFECTIONS.

To the Editor of THE LANCET.

SIR,—Mr. Scott Brown in your issue of May 2nd (p. 960) points out the peril of thrombophlebitis of the cavernous sinus from seemingly trivial infections about the face. He agrees with observations recorded by many that infection usually occurs via the facial vein. Surely then the rational procedure is to forestall spread of infection by this route. This can be accomplished by ligating the angular vein. I have dealt fully[1] with this preventive operation. Secondly, I wish to reiterate the teaching of Ochsner that to incise or excise a carbuncle of the lip is most dangerous. Local treatment with ample hot moist dressings of magnesium sulphate preceded by peripheral auto-injections of whole blood is attended by far better results than excision. Lastly, when cavernous sinus thrombosis is established, but the patient has yet a good hold on life, may I draw attention to Eagleton's operation described in his thoughtful book, "Thrombophlebitis of the Cavernous Sinus" (New York, 1926).

I am, Sir, yours faithfully,

Harley-street, May 2nd, 1931. HAMILTON BAILEY.

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[1] Surgery, Gynecology, and Obstetrics, April, 1928.

ABERRANT MILK SECRETIONS.

To the Editor of THE LANCET.

SIR,—A group of workers at the London (R.F.H.) Medical School are anxious to obtain abnormal secretions of human milk for analysis and comparison. Secretions before pregnancy or any other aberrant milk secretions would be welcomed. We should be grateful if any of your readers who may come across such secretions would get into touch with us, in order that we might obtain specimens for analysis.

I am, Sir, yours faithfully,

SIBYL T. WIDDOWS.

London (Royal Free Hospital) School of Medicine for
Women (University of London), Hunter-street,
Brunswick-square, W.C., May 2nd, 1931.

POST-OPERATIVE VOMITING.

To the Editor of THE LANCET.

SIR,—Dr. Cook's paper on this subject in your issue of April 18th was both interesting and valuable. The percentage of cases which vomited after gas-oxygen, though favourable when compared with ether and other agents, seemed rather higher than one would expect. One would like to ask then whether the cases classified as "nitrous-oxide" and "gas" received ether in addition to reinforce the action of the anæsthetic? I think it is important to know this, and if Dr. Cook would use your columns to answer this question the value of her paper would be increased.

I am, Sir, yours faithfully,

Dundee, May 2nd, 1931. A. H. MACKLIN.

PANEL PRACTICE

Pregnancy and Sickness Benefit.

THE *National Insurance Gazette* continues its useful transcript of the evidence given by Sir Walter Kinnear, controller of national insurance, before the Royal Commission on Unemployment Insurance. In reply to a commissioner he agreed that pregnancy is not in itself sufficient to entitle an insured woman to sickness benefit under the Insurance Acts. Asked whether he would say that this was so in all stages up to the last, Sir Walter replied:

"The claims of married women, especially during pregnancy and after childbirth, is one of the problems of the health insurance scheme. The sickness claims of married women have risen by over 100 per cent. in the last ten years, and the disablement claims by over 150 per cent. The largest proportionate increase is in the case of married women of 45 years and under, and one of the most difficult questions the societies have to decide is when sickness benefit is properly payable during pregnancy. The society must be satisfied that the statutory condition of incapacity for work is fulfilled in these as in all other cases. A state of pregnancy does not necessarily give rise to incapacity. In the case of women in regular employment as wage earners (for instance, mill hands or factory workers), there is generally unfitness for the ordinary employment for some period before confinement, and if at the same time there is such a degree of bodily disablement as to prevent the woman from undertaking any other kind of work—except possibly household duties of the lightest character—the societies have little difficulty in regarding the statutory condition as fulfilled, and benefit is paid. Less easy of treatment, however, is the case where the woman, although admittedly unable to follow her ordinary occupation, is nevertheless capable of performing the ordinary work of her home. Where, in cases of this latter kind, the claim for benefit is submitted a substantial time before the expected date of the confinement, the society would feel considerable hesitation about admitting it—such hesitation being based on the ground that the performance of ordinary household duties may not unreasonably be regarded as an alternative occupation in the case of a married woman. Where, however, the claim is not made until a comparatively late stage, it would be much more likely to receive favourable consideration, inasmuch as societies in general are prepared to recognise the inherent probability of incapacity during the period immediately anterior to confinement."

Change of Doctor.

In the House of Commons on April 30th Mr. Albery asked the Minister of Health what provision was made for the medical attendance and treatment of an insured person who, at the commencement of a quarter, felt he could not any longer accept medical attendance and treatment from his insurance practitioner, and, when the consent to transfer by that practitioner was refused, was the insured person compelled to pay for his medical attendance and treatment by another doctor during the remainder of the quarter until the transfer was effected by giving one month's notice to the insurance committee.

In reply, Mr. Greenwood said that in these circumstances the insured person would normally be expected to apply for any necessary treatment to the insurance doctor on whose list he remained; and if he applied for treatment to another doctor any charges for such treatment would not be payable out of insurance funds. But in case of accident or other sudden emergency, application could be made by the insured person to another insurance doctor for treatment at the cost of insurance funds, if the doctor on whose list he remained (or his deputy) were not available.

LONDON HOMŒOPATHIC HOSPITAL.—When the Duke of York, the President, visits this hospital on May 20th he will receive the Royal Charter of Incorporation which has been granted to the hospital. The Duchess of York will also attend and receive purses for completion of the debt of £3126 on the extension of the nurses' home to 107 beds at a cost of £13,839.

RESEARCH FELLOWSHIPS IN TUBERCULOSIS.—The Dorothy Temple Cross research Fellowships in tuberculosis for 1931–1932 will shortly be awarded by the Medical Research Council, and applications should be lodged with the Council not later than June 6th. The object of these Fellowships is to give special opportunities for study and research to persons "intending to devote themselves to the advancement by teaching or research of curative or preventive treatment of tuberculosis in all or any of its forms." Candidates must be British subjects, and must possess suitable medical, veterinary, or scientific qualifications. The Fellowships will preferably be awarded to those who wish to conduct their studies or inquiries outside Great Britain. They will, as a rule, be awarded for one year, but in special cases may be renewed. The value of the Fellowships will depend upon the standing and qualifications of the candidate, but will not be less than £300 per annum, with travelling expenses in addition. It may also be possible to award a senior Fellowship of considerably greater value to a specially well-qualified candidate wishing to undertake an intensive study of some particular problem of tuberculosis at a chosen centre of work in another country. Further particulars and forms of application are obtainable from the secretary of the Council, 38, Old Queen-street, London, S.W. 1.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

PHARMACY AND POISONS BILL.

THIS Bill was considered on Report in the House of Lords on April 28th.

THE TITLE OF CHEMIST.

On Clause 7 (Restriction on the use of certain titles, &c.) Viscount BERTIE OF THAME moved an amendment designed to prevent the use of the title "chemist" by unqualified dispensers in a hospital or in a laboratory of a manufacturing house. He said that such a use of the title "chemist" was not only misleading within the hospital itself, but might easily become a means whereby a person not entitled to do so could obtain possession of drugs, such as morphine, cocaine, or heroin, which under the Dangerous Drugs Acts might only be ordered by a medical practitioner, or a pharmacist, for hospitals.

Lord PONSONBY (Chancellor of the Duchy of Lancaster) said he thought Lord Bertie did not quite appreciate that the word "dispensing" really meant supplying. So far as dispensing in shops was concerned the point was already dealt with in the Bill. If it was intended, as he gathered from what Lord Bertie had said, that the amendment should cover the case of so-called dispensing in hospitals, the amendment would not have that effect. Therefore he could not accept it.

Lord BERTIE withdrew the amendment.

KEEPING OPEN SHOP FOR DISPENSING.

On Clause 18 (Prohibitions and regulations with respect to the sale of poisons) Lord PHILLIMORE moved a new paragraph making it unlawful for any person to keep open shop for the dispensing of prescribed medicines unless that person was an authorised seller of poisons. He said that Lord Ponsonby, when this amendment was moved in Committee, took objection to it on four grounds, one of which was that it would involve great hardships because there were many parts of the country where there was no registered pharmacist within reach. That this would not result from the amendment, if carried, was shown by the working of the National Health Insurance Act, under which all farm workers in fact came, and who were in most country districts supplied with medicine dispensed by a doctor. If this amendment was adopted, doctors being free to dispense, the same practice would prevail. Lord Ponsonby's second objection was based upon the fact that the Society's amendment, as originally drafted, would prevent the supply of simple uncompounded medicines. To meet that the wording of the amendment had been changed, and the word now used was "dispensed," which was the same word used in the National Health Insurance Act. The noble lord had also objected on the ground that the amendment would interfere with the possibility of persons holding the assistant's certificate of the Society of Apothecaries and ex-army compounders from dispensing in chemists' shops. As redrafted the amendment overcame that objection. A further objection was that it would lead to an increase in price, an argument with which he (Lord Phillimore) would be in very great sympathy, but he would point out that there would be over 10,000 shops which would be qualified to dispense in this country, and the ordinary rules of competition would probably ensure a sufficiently cheap supply. The noble lord also suggested that the amendment would interfere with the supply of veterinary medicines. With that point again he (Lord Phillimore) was in the greatest sympathy, and he had received from the Royal College of Veterinary Surgeons a suggestion that qualified surgeons should be added to the doctors and dentists qualified to dispense.

Lord PONSONBY said that as dispensing a medicine was defined in Clause 26 supplying a person "in accordance with a prescription duly given by a duly qualified medical practitioner," the effect of this amendment would be to prevent any person, except a registered pharmacist, supplying a medicine on a doctor's prescription. This was a matter of a very far-reaching character. The Government had consulted very closely with the medical profession on this point, and they had their whole-hearted support for the attitude they had taken up. This amendment asked for the pharmaceutical chemist an absolute monopoly and a control of prices. The analogy with the provision under the National Health Insurance Act did not hold good, because there the prices were controlled. The amendment would also rule out army dispensers, those who had certificates of the Society of Apothecaries, and any unregistered pharmacist. Whether that should be done or not he did not want to discuss now, but it was quite obvious that if such a very drastic proposal was to be adopted, and to be included in an Act of Parliament, there should be a very widespread inquiry into the whole case before legislative action was taken. He must therefore resist the amendment.

The amendment was negatived.

The Report stage of the Bill was concluded. On April 30th the Bill was read the third time and passed.

SMOKE ABATEMENT.

On April 28th in the House of Lords Viscount MERSEY asked the Government what measures were now being taken to deal with smoke abatement.

Lord PARMOOR (Lord President of the Council), in reply, said that an immense amount of work had been done, and was being done, with a view to a solution of this difficult problem. He thought that it was part of the Report of the Committee which was presided over by Lord Newton that it would be necessary to deal with the domestic coal fires in order to secure a real reform and modification of the atmospheric pollution which affected London and so many towns at the present time. But that, he was afraid, until public opinion was further educated in the right direction, was an obstacle standing in the way of true progress towards the removal of smoke pollution. An estimate in 1921 showed that in London the smoke pollution consisted of roughly two and a half parts by domestic smoke as against one part due to industrial smoke. Since that time industrial activity in London and its surroundings had increased, and unless steps were taken in time they would suffer very much more in the future than they had done in the past from smoke pollution. Great advances had been made in the direction of better combustion in industrial furnaces, but little or nothing had been done as regarded the ordinary open fireplace.

ADMINISTRATIVE ACTION.

Everything was being done, he thought, that could be done from an administrative point of view by the Ministry of Health. The scientific department of the Privy Council were engaged in important research experiments on this subject. No directly active function of smoke abatement was vested in the Ministry of Health, or any other Government Department, but the Ministry stood in general supervisory relation to the activities of the local authorities under the Act of 1926, and so on. So far as he knew there had been no direct complaints of the administrative action of the Ministry of Health under the Act of 1926. Generally speaking, there had been great coöperation and mutual assistance between the local authorities and the Ministry, and many steps had been taken in the right direction. Sunlight—an important factor in national health—was obscured to the extent of about 50 per cent. by smoke pollution of the atmosphere in some of the larger and more thickly inhabited districts of the country. According to the sixteenth report of the scientific department of the Privy Council in some places there was no ultra-violet light at all. He would like to think that there would be no further delay in further dealing with this problem, but he was bound to admit that just now, at any rate, was not a time when further work could be undertaken in these directions by the Government. At the same time the departments concerned were doing what they could to deal with the matter. What was really wanted was a careful analysis of the results obtained from experimental research, and then to use that analysis to put an end to what was not only a loss to health but also a loss in many other directions.

HOUSE OF COMMONS.

THURSDAY, APRIL 30TH.

Free Milk to Necessitous Children.

Mr. FREEMAN asked the President of the Board of Education the amount paid by the Government and the local authorities towards the cost of providing free milk to necessitous children last year; and whether, in view of the fact that all school-children would be benefited by this provision and the large surplus of fresh milk being produced in this country, he would consider the desirability of increasing the Government contribution to encourage local authorities to provide a daily supply of milk for every child.—Mr. LEES-SMITH replied: I regret that I have no material for a reliable estimate of the cost to local authorities and to the Exchequer, during last year, of the provision of free milk as distinct from free meals of other kinds provided for necessitous children. At the present time approximately 50,000 children are being supplied daily with free milk at a cost which may be estimated at £2000 to £3000 per week. I do not contemplate any increase in the percentage of this expenditure to be borne by the Exchequer.

National Health Insurance Funds.

Mr. REMER asked the Minister of Health what were the future liabilities against which the sum of £127,000,000 to the credit of the National Health Insurance Fund had been accumulated; and by what sum, approximately, annually this credit was being added to.—Mr. GREENWOOD replied: The sum to which the hon. Member refers is represented, in the main, by the funds of the approved societies. It is required to supplement the contributions as the insured grow older, and the claims for sickness and disablement benefits increase, to meet the cost of additional benefits provided wholly out of surplus capital as ascertained on valuation, and to cover the cost of medical benefit after the age of 65 when contributions have ceased. In answer to the latter part of the question no general average can be given. The position varies from society to society, but taking all societies together a decrease of £2,500,000 was sustained in 1929, followed by an increase of £1,000,000 in 1930.

MONDAY, MAY 4TH.

Ministry of Pensions Hospitals.

Sir ASSHETON POWNALL asked the Minister of Pensions how many Ministry hospitals were the property of the State; their situations; the total number of beds; and the average annual percentage of beds occupied.—Mr. F. O. ROBERTS replied: There are seven hospitals in the occupation of the Ministry which are the property of the State, apart from hospitals which are held on lease for short or longer periods. The particulars desired as regards each of these hospitals are as follows:—

Ministry of Pensions Hospital.	Total No. of beds.	Average annual percentage of beds occupied.
Maghull, near Liverpool	200	89·1
Chepstow, Monmouthshire	151	80·6
Queen Alexandra Hospital, Cosham, near Portsmouth	285	89·1
Chapel Allerton, Leeds	176	88·4
Mossley Hill, Liverpool	300	88·9
Latchmere (Officers Hospital), near Richmond	58	75·9
Fernbank, Roehampton	28	75·0

Vegetarian Diet.

Mr. FREEMAN asked the Home Secretary whether a vegetarian diet was provided for all prisoners who desired it.—Mr. CLYNES, replied: Yes, Sir.

Mr. FREEMAN asked the First Lord of the Admiralty whether a vegetarian diet was provided for all who desired it in the Navy.—Mr. ALEXANDER replied: The answer is in the negative.

Veterinary Colleges.

Sir WILLIAM JENKINS asked the Minister of Agriculture the number of veterinary colleges in this country; the number of such colleges in Germany, France, Russia, and the United States of America; what financial aid by way of grants was made to British colleges; and the number of students attending.—Dr. ADDISON replied: There are two veterinary colleges in England and Wales, five in Germany, three in France, fourteen in Russia, and eleven in the United States of America. My Department makes annual maintenance grants to the two English colleges as follows: £3,300 to the Royal Veterinary College, Camden Town, and £2850 to the School of Veterinary Science at Liverpool. These grants are fixed block grants for a period of five years and the amount in each case is now under reconsideration. There are 200 students at the Royal Veterinary College and 61 at the Liverpool School.

TUESDAY, MAY 5TH.

Vegetarian Diet.

Mr. FREEMAN asked the Secretary for War whether a vegetarian diet is provided for all who so desire it in the Army.—Mr. SHAW replied: No special vegetarian diet has been approved, but vegetables form a balanced proportion of the soldier's standard diet.

Provision of Spectacles for Insurance Patients.

Mr. GRAHAM WHITE asked the Minister of Health the total amount of national health insurance money spent on spectacles in each of the years 1928, 1929, and 1930; and the distribution of that expenditure between qualified and unqualified opticians.—Mr. GREENWOOD replied: The total amounts spent by approved societies and branches in England on ophthalmic benefit during the years mentioned were as follows: 1928, £270,600; 1929, £278,200; 1930, £353,300. These sums include payments for ophthalmic examinations and ophthalmic treatment, but the greater portion of them was spent on the provision of glasses. No information is available to show the amounts paid to particular opticians.

JOURNÉES MÉDICALES DE BRUXELLES.—The eleventh session of this society will be held at Brussels from June 20th to June 24th, under the patronage of the King and Queen of Belgium. The session will be the occasion of paying homage to the memory of Fernand Widal, and in this design the president, Prof. Auguste Ley, has received promises of support from a distinguished group of pathological workers. The meetings will be held on the invitation of the University of Brussels at the new buildings, the Solboch, and the Secretary-General, Dr. Beckers (145, Rue Belliard, Brussels), will give full information to intending visitors and adherents to the congress.

LONDON AND COUNTIES MEDICAL PROTECTION SOCIETY.—The annual general meeting of this society was held at Victory House, Leicester-square, London, on April 29th, the President, Sir John Rose Bradford, being in the chair. The adoption of the annual report, accounts, and balance-sheet was unanimous, following on the statement from the chair as to the numerical and financial position of the society, 800 new members having been enrolled during the year, while the surplus funds stood at a satisfactory and increasing figure. While expressing satisfaction at having so favourable a record to put forward, the President pointed out that there were still a large number of doctors and dentists not belonging to any defence association, thereby running risks with a temerity which he could not understand, having regard to the slight financial cost for which protection could be obtained. Sir John then called attention to the sad loss sustained by the society through the deaths of Mr. W. H. Carson, the well-known surgeon, who had recently joined the Council, Dr. J. H. Stowers, one of the most regular attendants at the business meetings, and Mr. A. G. R. Foulerton, who was associated with the society for 30 years and whose labours as financial secretary have been of the highest value.

Sir John Rose Bradford was re-elected as president, Dr. C. M. Fegen as treasurer, and Dr. Hugh Woods as general secretary. The President at the conclusion of the meeting made a statement arising out of the vacancy in the office of financial secretary caused by Mr. Foulerton's death, and said that it had been decided not to fill up this particular office, but to consider the appointment of a special committee upon office organisation. Messrs. le Brasseur and Oakley were re-elected as solicitors, and Messrs. Duncan Allwork and Co. as auditors.

OBITUARY

SIR BYROM BRAMWELL, M.D. Edin., F.R.C.P. Lond. & Edin.,

LATE PRESIDENT OF THE ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.

As was briefly announced in these columns last week, the death occurred in Edinburgh, on April 27th, of Sir Byrom Bramwell, the well-known physician and sometime President of the Royal College of Physicians of Edinburgh. He was in his eighty-fourth year.

SIR BYROM BRAMWELL.

[Photograph by A. Swan Watson.

Byrom Bramwell was born in 1847, the son of Dr. John Byrom Bramwell, a physician practising in North Shields. He received his preliminary education at Cheltenham and proceeded to the University of Edinburgh, where he graduated in medicine with honours in 1869. After filling the post of house physician at the Edinburgh Royal Infirmary he went into general practice in North Shields, and carried on a busy professional life there with extreme industry and ability. For five years he held numerous appointments in the poor-law and public health services, as surgeon to the police, and as a visiting medical officer at large charitable institutions. But in 1877, the year when he obtained the M.D. degree, with gold medal, at Edinburgh, he was appointed lecturer on medical jurisprudence at the Durham College of Medicine, and gave up his general practice and the numerous appointments directly associated with it to enter on a successful career as a teacher. He was appointed physician and pathologist to the Royal Infirmary, Newcastle-on-Tyne and lecturer on clinical medicine and pathology in the University of Durham College of Medicine; and held this post until his appointment in 1879 as lecturer on practical medicine in the Extra-Academical School at Edinburgh in which city the rest of his professional life was spent.

Thus, when after strenuous work at Newcastle, Byrom Bramwell decided to return to Edinburgh he was but 32 years of age, and young to aspire to the position of a consultant physician in a city like Edinburgh. But he had an unusual background, and his youth stood him in good stead. He had been appointed physician to a large infirmary some five years previously, and had used the interval in storing experience and adding to knowledge which he had already acquired in smaller institutions, in several walks of official medicine, and also in general practice. His seniors in Edinburgh may have regarded him as precocious, but his contemporaries remembered him as a brilliant student and also as a successful athlete, the proficiency in games which marked his school life at Cheltenham having been displayed in the University playing fields.

At the Extra-Academical School his teaching was an unqualified success. He attracted a large number of students and he taught them in a fundamental manner the things that it would be useful for them to know. He had the gift not only of teaching but of sensing what are the things that it was essential for a professor to teach, and his lectures on the practice of medicine and the science of diagnosis marked him out as the kind of instructor whose aid his pupils would want to obtain later in case of doubt or difficulty. Elected in 1880 to the Fellowship of his College he continued his discourses on the principles and practice of medicine in the Extra-Academical School until in 1882 he was appointed pathologist to the Royal Infirmary, a post which gave him a most valuable background for observation and research and which led soon to his election as assistant physician to the Royal Infirmary. Here again his range of knowledge and his ability to bring practical experience to bear in such varied directions made him a tower of strength as a teacher. He was soon elected full physician to the infirmary, and the success which attended his regular discourses here was as marked as it had been at the Extra-Academical School. Especially valued were his clinical demonstrations which were concise, clear, and if dogmatic were always accompanied by reasons for the view taken, deduced from personal experience. He established a large reputation as a consultant as the outcome of this work, and thenceforward, until his retirement, his advice was sought all over Scotland and the north of England.

Sir Byrom Bramwell from the beginning of his career was prompt to record what he knew, and what he surmised, in literary form, and alike as general physician, as cardiologist, and as neurologist he was the author of valuable instruction. He wrote an atlas of clinical medicine, and his studies along the same lines, published over 20 years ago, comprised eight useful volumes. He wrote on disease of the spinal cord, on the pathology of the heart and the thoracic aorta, on intracranial tumours, on the ductless glands—where he was early in associating endocrinology with certain skin diseases, and on phthisis especially from the public point of view on the question of notification. He also made early in his career interesting contributions to the subject of aphasia, and published in THE LANCET, as far back as 1897, a series of articles on this and on disorders of the speech, when his detailed accounts impressed all who read them by the extreme care displayed in the clinical observations and the importance laid throughout on the necessity of careful records of pathological conditions. These papers formed a preliminary contribution to further discussions from his pen on the subject, which always remained one of great interest to him.

As was natural, such a man received many academic honours. He was an honorary LL.D. of the universities of Edinburgh, St. Andrews, and Birmingham, and an honorary D.C.L. of the universities of Edinburgh and Durham. He was elected, not before the honour was due, President of the Royal College of Physicians of Edinburgh. He was at different times president of the Medico-Chirurgical Society of Edinburgh, and of the Association of Physicians of Great Britain and Ireland. He was a Corresponding Member of numerous foreign societies and academies, and he was the first honorary president of the Royal Medical Society of Edinburgh. The election to this post, which was particularly gratifying to him, was followed by the presentation to him of his portrait by his friends and his old pupils. In 1924 he received the honour of knighthood.

Sir Byrom Bramwell married in 1872 Martha Crighton, daughter of Mr. Edwin Crighton of North Shields, who predeceased him, and is survived by a daughter and three sons, two of whom are distinguished members of the medical profession.

MEDICINE AND THE LAW.

Sale of Poison from Automatic Machine.

A DULY registered chemist and druggist had an automatic machine outside his shop from which, amongst other drugs, a bottle of lysol could be obtained by putting sixpence in the slot. To test the legality of this transaction the Council of the Pharmaceutical Society brought an action claiming a penalty of £5 under Section 3 (1) of the Poisons and Pharmacy Act, 1908. The judge at the Wood Green County Court imposed the fine but the High Court has allowed the chemist's appeal. Thus at the moment, although Parliament must have intended to restrict the sale of poisons without supervision, it seems to be lawful to sell bottles or packets of dangerous poison to any child of sufficient stature to reach up and put in its sixpence. The material provision of the 1908 Act makes it an offence (within Section 15 of the Pharmacy Act of 1868 which imposes the £5 penalty) for any duly registered pharmaceutical chemist or chemist and druggist to carry on the business of pharmaceutical chemist or chemist and druggist "unless, in every premises where the business is carried on, the business is *bonâ fide* conducted by himself or some other duly registered pharmaceutical chemist or chemist and druggist."

The county court judge found that the automatic machine was so closely attached to the premises as to form part of them, that lysol was a dangerous poison, that its sale from the machine was not supervised, and that the chemist carried on the business of chemist and druggist at the automatic machine. The King's Bench Division says that "*bonâ fide* conducted," in the 1908 Act quoted above, means that the chemist himself must be conducting the business and not delegating the task to somebody else. The words refer to the person carrying the business on, not to the method. The machine business was conducted by the defendant chemist with regard to the placing of the machine, the contents of the machine, and the periods during which sale through the machine was possible. The words "in every premises" do not mean "in every part of the premises," or still less "at all times or hours"; in any business of any size the person conducting it must necessarily from time to time leave the actual conduct to a subordinate. The Pharmaceutical Society was seeking, says the High Court, to apply the section to something at which it was not aimed.

The result seems ludicrous. What is the use of the Society proceeding (as in the well-known Wheeldon case in 1890) against the unqualified person who sells poisons if a machine may sell them automatically? The High Court invites the Society to press for a change in the law. The Bill which is now proceeding through the House of Lords offered an opportunity, but Lord Ponsonby resisted Lord Bertie's proposed amendment on April 28th on the ground that manuscript amendments ought not to be accepted on the report stage, although the procedure of the upper House is generally elastic enough. Members of the House of Commons should be pressed to deal with the difficulty when the Bill reaches them.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED APRIL 25TH, 1931.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 212; scarlet-fever, 1499; diphtheria, 888; enteric fever, 31; pneumonia, 933; puerperal fever, 48; puerperal pyrexia, 104; cerebro-spinal fever, 76; acute poliomyelitis, 1; acute polio-encephalitis, 1; encephalitis lethargica, 15; dysentery, 6; ophthalmia neonatorum, 96. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on April 28th–29th was as follows:—Small-pox, 222 under treatment, 6 under observation (last week 208 and 8 respectively); scarlet fever, 1254; diphtheria, 1542; enteric fever, 12; measles, 143; whooping-cough, 436; puerperal fever, 28 (plus 14 babies); encephalitis lethargica, 142; poliomyelitis, 2; "other diseases," 183. At St. Margaret's Hospital there were 22 babies (plus 10 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was 1 death from small-pox, 3 (0) from enteric fever, 42 (3) from measles, 5 (2) from scarlet fever, 30 (5) from whooping-cough, 21 (4) from diphtheria, 34 (7) from diarrhœa and enteritis under two years, and 96 (20) from influenza. The figures in parentheses are those for London itself.

The death provisionally classified to small-pox was assigned to Lambeth Metropolitan Borough. There was also 1 death from small-pox reported for the month of March and provisionally assigned to Guildford Rural District. The deaths from enteric fever occurred in Blackburn, York, and Sunderland. Five deaths from meningococcal meningitis occurred in London, 2 under one year, 1 each from 2–5, 15–25, and 55–65 years. Six fatal cases of measles were reported from Birmingham, 5 from Liverpool, and 4 from Sunderland. Liverpool reported 5 deaths from whooping-cough. The 76 fatal cases of influenza outside London are scattered over 47 great towns: 7 were reported from Birmingham and 4 from Leeds.

The number of stillbirths notified during the week was 270 (corresponding to a rate of 38 per 1000 births), including 31 in London.

DEATHS CLASSIFIED TO SMALL-POX.

THE death in Lambeth was that of a girl, aged 7, who fell ill on April 13th, the rash appearing on April 16th, when her condition became much better. Dr. A. G. G. Thompson, medical officer of health, saw the girl on April 19th, when the rash was about three days old. She felt shivery but was not apparently ill. Temp. 99° F. at noon. She was removed to hospital in the evening and on arrival there had a very high temperature with considerable lethargy. She died early on April 21st. The post-mortem findings pointed definitely to an encephalomyelitis. There is not much doubt, Dr. Thompson adds, that this was in some way connected with the small-pox. The cause of death was certified as 1 (*a*) encephalitis myelitis, (*b*) small-pox. The child had not been vaccinated.

The second death was that of a male, aged 55, who was a patient in Croydon Hospital suffering from broncho-pneumonia when he contracted mild small-pox and was transferred to Clandon Isolation Hospital, where he died on March 17th. Dr. J. Ferguson, county medical officer for Surrey, tells us that the cause of death was certified: (*a*) cardiac failure, (*b*) broncho-pneumonia, (*c*) mild small-pox. There was no post-mortem examination.

MEDICAL NEWS

Royal College of Physicians of London.

A quarterly meeting of the College was held on April 30th with Lord Dawson, the President, in the chair. The following Members were elected to the Fellowship:—

Haldinstein David Haldin-Davis, M.D.Oxf.; Gustave Jean Philippe Monod, M.D. Paris; John Rupert Collins, M.D. Dublin; Alexander Greig Anderson, M.D. Aberd.; Gilbert Innes Strachan, M.D. Glasg.; Hugh James Orr-Ewing, M.D. Lond.; George Robinson Pirie, M.B. Toronto; Thomas Forrest Cotton, M.D. McGill; Hugh Stannus Stannus, M.D. Lond.; Thomas Herbert Oliver, M.D. Manch.; Frederick John Nattrass, M.D. Durh.; Alfred Alexander Webster Petrie, M.D. Lond.; Norman Brandon Capon, M.D. Liverp.; Reginald Hilton, M.D. Camb.; Adam Patrick, M.D. Glasg.; Sir Bernard Spilsbury, M.D. Oxf.; Walter Russell Brain, M.D. Oxf.; Davis Evan Bedford, M.D. Lond.; John Forest Smith, M.R.C.S.; John Davy Rolleston, M.D. Oxf.; Edgar Hartley Kettle, M.D. Lond.; Leslie John Witts, M.D. Manch.; James Andrew Gunn, M.D. Edin.

The following candidates were elected Members of the College:—

Melville Hula Aiken, M.B. New Zeal.; Mohammed Ali Arafa, M.B. Cairo; Eric Tom Bates, M.B. Liverp.; Frank Howard Beare, M.D. Adelaide; Wilfred Venn Bowman, L.R.C.P.; Edward Francis Brooks, M.D. Toronto; Thomas Benjamin Davie, M.D. Liverp.; Thomas Anwyl Davies, M.D. Lond.; Claude Ernest Dolman, M.B. Lond.; Archibald Gilpin M.B. Lond.; John Malise Graham, M.B. Camb.; Cecil John Hackett, M.B. Adelaide; Donald Frederick Kanaar, M.B. Lond.; Walter Montague Levitt, M.B., N.U.I.; Chisholm McDowell, M.B. New Zeal.; Eric Gordon Oastler, M.B. Glasg.; Catherine Jane Ormerod, L.R.C.P.; David Preiskel, M.B. Lond.; Seeniyappah Ramanathan, L.R.C.P.; William Gordon Sears, M.D. Lond.; Athelstan da Costa Stonte, L.R.C.P.; Oliver Frank Thomas, L.R.C.P.; Alexander Clive Rees Walton, M.B. Birm.; Theodore Henry Whittington, M.D. Lond.; Ernest Alan Wood, M.B. Lond.; Dorothy Evelyn Wright, M.D. Lond.

The President was appointed representative of the College on the Governing Body of the British Post-Graduate Hospital and Medical School; also representative of the College to the forthcoming centenary celebrations of the Harveian Society of London.

Licences to practise were conferred upon 106 candidates (95 men and 11 women) who have passed the Final Examination of the Conjoint Board and have complied with the by-laws of the College. The following are the names and medical schools of the successful candidates, viz.:—

R. C. Abel, Univ. Coll.; H. Allan, Middlesex; P. R. Allison, M.B., Leeds; Inez E. Banner, M.B., Punjab and Royal Free; S. Barigrasser, St. Bart.'s; J. S. Barker, *Camb. and St. Thomas's*; A. J. W. Beard, St. Bart.'s; N. J. Bee, London; D. R. Bharucha, M.B., Bombay and St. Bart.'s; N. Bissada, Cairo and Charing Cross; H. Bloom, Guy's; A. D. Bourne, St. Mary's; S. A. Bower, Birmingham; G. D. S. Briggs, St. Bart.'s; W. A. O. K. N. Bruce, Camb. and St. Thomas's; H. G. H. Butcher, Camb. and Manchester; G. N. Carrell, Guy's; P. H. Charlton, Middlesex; C. N. Chitnis, Bombay and St. George's; H. L. Cleave, Bristol; I. Culank, Middlesex; H. L. N. Davies, Birmingham; J. O. F. Davies, Middlesex; E. C. Dayus, St. Mary's; Yolande M. de la Pasture, M.B., Bristol; J. Dobson, Manchester; W. Dodd, M.B., Liverpool; G. A. Emmerson, Camb. and St. Mary's; D. Erskine, Guy's; L. P. J. Evans, Camb. and St. Bart.'s; S. H. Ferguson, Sheffield; B. Fine, London; J. Finner, Middlesex; Lena Kinkelstein, Penn. and Charing Cross; A. C. Fraser, Camb. and St. Bart.'s; J. W. O. Freeth, St. Bart.'s; L. T. Furnivall, St. Mary's; K. H. Gaskell, Camb. and King's Coll.; S. E. Godwin, St. Bart.'s; I. Gold, London; J. T. Griffiths, Cardiff and Univ. College; Constance A. Grove, Camb. and Charing Cross; E. A. Gudgeon, St. George's; K. Harris, Guy's; K. Hazell, Bristol and King's Coll.; C. B. Hinkley, St. Thomas's; G. Hyman, Leeds; F. J. V. Jaensch, St. Bart.'s; S. S. Jaikaran, Camb. and St. Thomas's; I. O. Jones, Guy's; A. Kahan, St. Thomas's; G. D. Kersley, Camb. and St. Bart.'s; D. H. Klugman, Guy's; L. E. D. Knights, Middlesex; J. S. Knox, St. Bart.'s; Nancy Laughton, Birmingham; C. H. Levick, Sheffield; D. L. Lewis, Camb. and St. George's; A. Liberis, L.M.S.S.A., St. Bart.'s; J. W. S. H. Lindahl, Camb. and St. Thomas's; A. B. MacEwan, Camb. and London; R. W. McNabb, Guy's; J. M. Matthew, Camb. and King's Coll.; R. H. Moore, Bristol; Ian More, Univ. Coll.; G. G. Mowat, Camb. and St. Thomas's; D. H. Murphy, Sheffield; W. H. Mylechreest, Camb. and St. Thomas's; W. M. Niblock, Camb. and King's Coll.; J. E. A. O'Connell, St. Bart.'s; Elizabeth G. S. Owen, Bristol; R. Palmer, Camb. and King's Coll.; W. R. Parkes, Camb. and St. Thomas's; R. M. Paton, St. Thomas's; H. A. Phillips, M.D., Melbourne; D. R. Prem, Bombay and King's Coll.; W. M. Priest, Univ. Coll.; R. V. C. Richards, Cardiff and Bristol; H. J. Riley, Birmingham; S. Rosenbloom, M.B., Leeds; A. G. Sanders, St. Thomas's; E. M. Sastry, M.B., Andhra; Ida B. Saxby, D.Sc. Lond., Bristol; J. Scholefield, M.B., Leeds; P. G. Scott, Camb. and St. Bart.'s; A. Segil, Witwatersrand and Guy's; J. H. Shakespeare, Camb. and St. George's; D. A. Smith, St. Bart.'s; R. B. F.-A. Usher Somers, Birmingham; K. S. Southam, Guy's; T. C. Stamp, Camb. and St. Bart.'s; H. W. G. Staunton, St. Bart.'s; A. B. Stokes, Oxford and King's Coll.; N. S. Taggart, Manchester; H. S. Tibbits, Camb. and Birmingham; Marion E. Townsend, Royal Free; D. S. Valentine, St. Thomas's; E. D. Ward, Camb. and St. Thomas's; Evelyn A. M. White, Univ. Coll.; Margaret M. White, Royal Free; G. A. W. Whitfield, Camb. and Univ. Coll.; R. G. Wilbond, Bristol; J. L. Wild, Camb. and St. Thomas's; I. G. Williams, Middlesex; Mary Wills, Royal Free; C. Wilson, Oxford and London.

University of London.

At recent examinations the following candidates were successful:—

D.P.H.

R. J. Muzumdar.

Part I.—R. E. Barrett, Edgar Cochrane, May P. Cowell, H. A. Crouch, N. J. England, D. W. G. Faris, Marguerite M. Fenn, H. S. Gear, J. E. Howard, I. J. Jones, G. C. Kelly, Hazel Machado, Hilta I. C. Pfister, John Portelly, L. E. J. Poulier, Dorothy M. Rees, Florence M. Rhodes, J. T. N. Roo, A. P. Ross, B. M. Roy, A. T. Till, W. J. Webster, and H. B. Wilson.

Society of Apothecaries of London.

At recent examinations the following candidates passed in the undermentioned subjects:—

Surgery.—H. R. Giblin, St. Mary's Hosp.; and H. A. T. Wells, Guy's Hosp.

Medicine.—L. Banszky, Middlesex Hosp.; G. C. Brown, Univ. of Cambridge and St. Mary's Hosp.; H. R. Fosbery and W. G. Kingston, Middlesex Hosp.; A. E. Mathews and L. Sachs, St. Mary's Hosp.; Grantley Smith, Univ. of Bristol and Guy's Hosp.; L. C. H. Sykes, Univ. of Leeds; H. W. Toussaint, St. Mary's Hosp.; C. D. Trimble, Univ. of Birmingham and St. Mary's Hosp.; and P. Wade, Univ. of Liverpool.

Forensic Medicine.—H. M. El Magidi, Univ. of Birmingham; W. Hertzog and J. S. Lane, Guy's Hosp.; F. G. Leckam, St. Mary's Hosp.; C. D. Trimble, Univ. of Birmingham and St. Mary's Hosp.; and C. F. Vieyra, St. Mary's Hosp.

Midwifery.—G. Handelsman, Univ. of Witwatersrand and London Hosp.; S. Lokecz, St. Bart.'s Hosp.; C. Morgan, Charing Cross Hosp.; R. Pakenham-Walsh, Univ. of Oxford and St. Mary's Hospital; and S. Ramarao, London Hosp.

The following candidates having completed the Final Examination, have been granted the Diploma of the Society entitling them to practise Medicine, Surgery, and Midwifery:—G. C. Brown, H. R. Fosbery, W. G. Kingston, J. S. Lane, L. Sachs, L. C. H. Sykes, C. D. Trimble, and P. Wade.

London Inter-Collegiate Scholarships Board.

This board announces that an examination for six medical scholarships and exhibitions, and one dental scholarship, of an aggregate value of £538, will begin on June 16th. They are tenable at University College and University College Hospital Medical School, the London (Royal Free Hospital) School of Medicine for Women, and the London Hospital Medical College. Full particulars and entry form may be obtained from the secretary of the board, Mr. S. C. Ranner, the Medical School, King's College Hospital, Denmark Hill, S.E. 5.

British College of Obstetricians and Gynæcologists.

A meeting of the Council was held in Glasgow on April 21st, with Prof. W. Blair Bell, the President, in the chair. The following Members were admitted to the Fellowship:—Ernest Farquhar Murray, William Henry Francis Oxley, and Gilbert Innes Strachan. The following were admitted to Membership:—Gerald Fitzmaurice Keatinge, Percy Malpas, Edward Lawton Moss, and Frank Neon Reynolds.

At the second annual general meeting, held in the Lister Memorial Hall, Glasgow, on April 22nd, it was reported that vacancies on the Council due to retirement had been filled by the re-election of Dr. Russell Andrews, Prof. H. Leith Murray, Dr. Bethel Solomons, and Prof. Beckwith Whitehouse. Dr. J. E. Stacey had been elected by vote as a representative of the provincial members.

Reviewing the work of the College during the past year the President spoke of the provision of a central home in London, which would not only be a centre for the business of the College but would be a place where Fellows and Members could meet each other and where a commencement could be made with what he hoped would become the finest obstetrical and gynæcological library in the country. The realisation of this aim had been brought nearer by a gift from Lord Riddell, who had previously given a donation of £1000 when the College received incorporation. Lord Riddell had now made a further gift of £600 per annum for seven years. Mr. Eardley Holland, the hon. treasurer, said it would be necessary to establish an endowment and a building fund. The present time did not seem propitious for launching a big appeal, but when the trade of the country improved he proposed to open an appeal for contributions.

A meeting of the new Council was held immediately after the annual general meeting, when the following officers were unanimously elected:—President: Prof. Blair Bell (Liverpool). Hon. treasurer: Mr. Eardley Holland (London). Hon. secretary: Prof. W. Fletcher Shaw (Manchester).

Aberdeen University Club, London.

The eighty-fifth half-yearly dinner of this club will be held at the Trocadero Restaurant on Thursday, May 21st, with Sir John Marnoch in the chair, and Sir Lenthal Cheatle as chief guest. The secretary's address is 9, Addison-gardens, W. 14.

Medical Prayer Union.

The annual medical missionary breakfast of this union will be held at 8 A.M. on Wednesday, May 20th, at the Refectory, University College, Gower-street, W.C.1. An address will be given by Dr. Edward A. Hunter, of Ilesha, Nigeria. An intimation of intention to be present will be welcomed by the honorary secretary, Dr. Tom Jays, Livingstone College, Leyton, E.10.

The Cancer Hospital.

The annual report states that the estimated cost of the new radiological department now being erected will be approximately £150,000. The University of London's chair in radiology, the first in the United Kingdom, is tenable at the hospital, and provision is being made for the teaching and practical training of pupils who, it is expected, will be attracted from all over the world.

Inter-State Post-graduate Assembly of North America.

In connexion with the forthcoming visit of this organisation to Europe a number of lectures have been arranged to be given in the Barnes Hall of the Royal Society of Medicine, Wimpole-street, W., on May 26th. Sir Thomas Horder will give an opening address, and Mr. Donald Armour will speak on the Treatment of Head Injuries, and Dr. Strickland Goodall on the Myocardium. On the 27th Mr. Lawrence Abel will give a cinema demonstration on the Treatment of Cancer of the Rectum, and Mr. Victor Bonney will give a gynæcological talk. Visits will be paid to the Middlesex Hospital, the Chelsea Hospital for Women, the Infants Hospital, the Temperance Hospital, the National Heart Hospital, and the Physical Therapy Institute in Park-crescent.

Medical Diary

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Tuesday, May 12th.—8.30 P.M., Psychiatry. *Election of Officers and Council.* Paper: Dr. Emanuel Miller: Eidetic Image as an Undertone of Psychosis.

Wednesday.—5 P.M., Surgery: Sub-section of Proctology. Election of Officers and Council. Discussion: The Injection Treatment of Piles.

Thursday.—8.30 P.M., Neurology. Election of Officers and Council. Specimens will be shown.

Friday.—8 P.M., Obstetrics and Gynæcology. Election of Officers and Council. Discussion: *The Relative* Value of the Induction of Premature Labour, Test Labour, and Cæsarean Section in the Treatment of *Minor Degrees of Contracted* Pelvis. Openers: Mr. R. Alan Brews, Mr. G. F. Gibberd, Dr. J. W. A. Hunter, Dr. A. Morris-Jones, Dr. Margaret Salmond, Dr. J. Gardener Wigley, and Dr. A. J. Wrigley.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

Monday, May 11th.—8 P.M., Annual General Meeting. 9 P.M., Sir John Rose Bradford: Annual Oration on Medicine as a Science and an Art, followed by a Conversazione.

HARVEIAN SOCIETY OF LONDON.

Thursday, May, 14th.—8.30 P.M. (at Town Hall, Paddington Green, W.): *Discussion* on Calcium Therapy (Opener: Dr. Donald Hunter).

PADDINGTON MEDICAL SOCIETY.

Tuesday, May 12th.—9 P.M. (at the Great Western Royal Hotel, Paddington), Dr. Egbert Morland: Medical Journalism.

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY, 11, Chandos-street, Cavendish-square, W.

Thursday, May 14th.—8.30 P.M., Dr. Luff: A Case of Obsessional Neurosis. Dr. Matthew Ray: The Psychological Factor in Fibrositis and Arthritis.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.

Monday, May 11th, and following Wednesday and Friday.—5 P.M., Sir Arthur Keith: Human Monsters and Malformations—illustrated by specimens.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

Monday, May 11th, to Saturday, May 16th.—Medical Society of London, 11, Chandos-street, Cavendish-square. M.R.C.P. *Special* evening lectures at 8.30 P.M. Tues., Dr. Donald Hunter: *Bone Growth* and Metabolism. Medical Aspects of Diseases of Bones. *Fri.*, Dr. L. J. Witts: Achlorhydria and Anæmia.—British Red Cross Rheumatism Clinic, Peto-place, Regent's Park. Mon., 2 P.M., Dr. B. S. Nisse: *Demonstration* in Women's Out-patient Department. (*No tickets necessary.*)—St. Mark's Hospital, City-road, E.C. Tues., 5 P.M., demonstration in Out-patient Department by Mr. W. B. Gabriel. (No tickets required.)—Prince of Wales's Hospital, Tottenham, N. Special all-day post-graduate course in general medicine, surgery, and the special departments. Demonstrations, operations, lectures.—City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E. All-day post-graduate Course in Diseases of the Chest. *Lectures and Demonstrations.*—Royal Eye Hospital, Southwark, S.E. *Afternoon Course in ophthalmology.* Demonstrations daily at 3 P.M.—St. John's Hospital, Leicester-square, W.C. Afternoon and evening demonstrations in skin diseases.—Further particulars from the Fellowship of Medicine.

NATIONAL HOSPITAL, Queen-square, W.C.

Monday, May 11th.—12 noon, Dr. *Greenfield: The* Cerebro-spinal Fluid. 2 P.M., Dr. Riddoch: Out-*patient Clinic.* 3.30 P.M., Mr. Williamson Noble: *Defects in the Visual Fields.*

Tuesday.—2 P.M., Dr. Walshe: *Out-patient Clinic.* 3.30 P.M., Mr. Armour: *Head Injuries.*

Wednesday.—2 P.M., Dr. Martin: Out-patient Clinic.

Thursday.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Critchley: Cerebral Vascular Disease (1).

Friday.—2 P.M., Dr. Adie: Out-patient Clinic. Mr. Elmquist: Demonstration of Re-educative Exercises (in Exercise Room).

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, Balham, S.W.

Wednesday, May 13th.—4 P.M., Dr. H. Crichton Miller: Functional Neurosis in General Practice.

ST. THOMAS'S HOSPITAL, Albert Embankment, S.E.

Wednesday, May 13th, and following Friday.—5.30 P.M. *(in the Governors' Hall)*: Prof. G. Grey Turner: Resection of the Rectum.

KING'S COLLEGE, *Strand*, W.C.

Monday, May 11th.—5.30 P.M., Prof. W. J. Dilling: The Pharmacology and Therapeutics of Lead Colloids. (Last lecture.)

UNIVERSITY COLLEGE, Gower-street, W.C.

Thursday, May 14th.—5 P.M., Dr. R. J. Lythgoe: Special Sense *Physiology.* (Second of six lectures.)

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE, Keppel-street, Gower-street, W.C.

Monday, May 11th.—5 P.M., Dr. C. F. White: Port Work.

Wednesday.—Dr. Bernard Hart: Mental Hygiene.

Friday.—Prof. E. L. Collis: Industrial Hygiene: Respiratory Diseases.

CITY OF LONDON MATERNITY HOSPITAL, City-road E.C.

Thursday, May 14th.—5 P.M., Mr. H. Burt-White: *Diagnosis* and Treatment of Uterine Infarction.

BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck-street, W.

Thursday, May 14th.—8.30 P.M., Annual general meeting. Mr. H. S. Souttar: Ideal Distribution of Radon Seeds.

Friday.—11 A.M. Visit to Royal Chest Hospital, City-road, E.C.

INSTITUTE OF PATHOLOGY AND RESEARCH, St. Mary's Hospital, W.

Tuesday, May 12th.—5 P.M., Prof. C. A. Ariens Kappers: The Function of the Various Layers of the Cortex.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital for Diseases of the Skin, Leicester-square, W.C.

Monday, May 11th.—5 P.M., Dr. H. MacCormac: Treatment of Syphilis.

Tuesday.—5 P.M., Dr. W. N. Goldsmith: The Nervous System in Relation to Skin Diseases.

Thursday.—5 P.M., Dr. J. M. H. MacLeod: Infections of the Skin with Yeast-like Organisms.

Friday.—5 P.M., Dr. W. Knowsley Sibley: Alopecia.

CHADWICK PUBLIC LECTURES.

Friday, May 15th.—8 P.M. (in the Institute of Mechanical Engineers, Storey's Gate, Westminster), Prof. E. L. Collis: The Coal Miner: His Health and Occupational Diseases.

UNIVERSITY OF BIRMINGHAM.

Tuesday, May 12th.—3.30 P.M. (at the General Hospital), *Mr. B.* T. Rose: Common Disorder of the Rectum.

Wednesday.—4 P.M. (in the Large Theatre of the Medical *Faculty* Buildings, Edmund-street), Sir Hubert Bond: Some Correlations between General and Psychological Medicine. (First of five William Withering Memorial Lectures.)

Friday (at the Queen's Hospital).—3.30 P.M., Dr. Philip *Cloake: Demonstration* of Medical Cases.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

Tuesday, May 12th.—4.15 P.M., Dr. T. H. Oliver: Rheumatoid Arthritis.

Friday.—4.15 P.M., Mr. A. H. Burgess: Demonstration of Surgical Cases.

MANCHESTER VICTORIA MEMORIAL JEWISH HOSPITAL, Elizabeth-street, Manchester.

Wednesday, May 13th.—4.30 P.M., Dr. H. Morris: Demonstration of cases in the X ray department.

In an advertisement in our last issue the title of Prof. Samson Wright's Oliver-Sharpey Lectures at the Royal College of Physicians of London should have read: "Certain Aspects of the Reflex Control of the *Circulation.*"

Appointments

GAMMIE, A. E., M.B., Ch.B. Aberd., has been appointed Medical Superintendent, Richmond and Heston-Isleworth Joint Isolation Hospital.

HOPKINS, E. L., L.R.C.P. Lond., M.R.C.S., D.P.H., Superintendent of the Derby County Mental Hospital.

MUMFORD, P. B., M.D., Ch.B. Manch., Hon. Dermatologist, Royal Infirmary, Manchester.

REID, J. R., M.B., Ch.B. Edin., D.P.H., Chief Asst. Medical Officer to the Education Committee, West Ham Town Council.

Vacancies

For further information refer to the advertisement columns.

Aberdeen Royal Infirmary.—Hon. M.O. for Diseases of the Skin Dept.

Barnet, Herts, Wellhouse Hospital.—Asst. M.O. At rate of £200.

Barrow-in-Furness, County Borough.—Asst. M.O. £500.

Bath, Royal United Hospital.—Asst. H.S. £150.

Battersea Borough Council, Maternity Hospital, Bolingbroke-grove, Wandsworth Common, S.W.—Res. M.O. £150.

Belgrave Hospital for Children, 1, Clapham-road, S.W.—H.S. At rate of £100.

Birmingham City Babies Hospital, Maternity and Child Welfare Dept.—Jun. Res. M.O. At rate of £100.

Birmingham Queen's Hospital.—Hon. Ophth. S.

Birmingham University, Faculty of Medicine.—Chair of Anatomy. £1100.

Blackburn Royal Infirmary.—Fourth H.S. £150.

Bootle General Hospital, Lancs.—2 H.S.'s Each at rate of £150.

Cancer Hospital, Fulham-road, S.W.—Director of Research Inst.

Cheadle, Royal Mental Hospital, Cheshire.—Locum Tenens. 7 gns. per week.

Chesterfield and North Derbyshire Royal Hospital.—Cas. O. and H.S. At rate of £200 and £150, respectively.

Connaught Hospital, Orford-road, E.—Res. Cas. O. At rate of £100.

Derby, Derbyshire Royal Infirmary.—Cas. O. £150.

Doncaster Royal Infirmary.—H.S. At rate of £175.

East London Hospital for Children and Dispensary for Women, Shadwell, E.—Res. Cas. O. £125.

Elizabeth Garrett Anderson Hospital, Euston-road.—H.P., Obstet. Asst. Also 3 H.S.'s. All at rate of £50.

Gloucester, Gloucestershire Royal Infirmary, &c.—2nd H.S. At rate of £120.

Hastings, East Sussex Hospital.—Jun. H.S. At rate of £100.

Hellingly, East Sussex County Mental Hospital.—Two Jun. Asst. Res. M.O.'s. Each £350.

Hong-Kong University, Faculty of Medicine.—Professor of Pathology. £1000.

Hospital for Epilepsy and Paralysis, Maida Vale, W.—Two Med. Regs. Each £100.

Hospital for Sick Children, Great Ormond-street, W.C.—Ophth. Surgeon.

Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Temp. Anæsthetist. At rate of £50.

Hove, Brighton, Hove and Preston Dispensary.—Hon. Physician for Ditchling-road Dispensary.

Hove, Lady Chichester Hospital.—H.P. At rate of £100. Also Jun. H.S. £50.

Huddersfield Royal Infirmary.—H.S. At rate of £150.

Hull Municipal Maternity Home and Infants Hospital.—Jun. Res. M.O. £100.

Hull Royal Infirmary.—H.S. to Ophthal. and Ear, Nose and Throat Depts. At rate of £150.

Ilford Borough.—Asst. M.O.H. £600.

Ilford, King George Hospital.—2 H.S.'s. Each at rate of £100.

Institute of Ray Therapy, 152-154, Camden-road, N.W.—Res. M.O. At rate of £150.

Inverness Royal Northern Infirmary.—H.P. At rate of £100.

Kettering U.D.C.—Part-time M.O. for Antenatal Clinic. £1 11s. 6d. per session.

King Edward Memorial Hospital, Ealing, W.—Consulting P., Consulting Dental S., Asst. Consulting S., and Consulting Anæsthetist. All honorary.

Leeds, Herzl Moser Hospital, Leopold-street.—R.M.O. £100.

Leicestershire and Rutland Mental Hospital, Narborough, near Leicester.—Asst. M.O. £350.

Liverpool Hahnemann Hospital, Hope-street.—Res. M.O. At rate of £100. Also Clin. Asst.

L.C.C. Hospital Laboratory Service.—Pathologist. £1100.

London Homœopathic Hospital, Great Ormond-street and Queen-square, W.C.—Asst. Surgeon for Diseases of the Throat, Nose and Ear.

London Hospital, E.—Asst. Phys. to Children's Dept.

London Jewish Hospital, Stepney Green, E.—Med. Reg. £100. Surg. Reg. and Ear, Nose and Throat Reg. Each 60 guineas. Res. M.O. and Cas. O. Each at rate of £150. Also Jun. Res. M.O. At rate of £100.

Macclesfield General Infirmary.—2nd H.S. At rate of £150.

Manchester, Ancoats Hospital.—Orthopædic H.S. At rate of £100.

Manchester Babies' Hospital, Burnage-lane, Levenshulme.—Hon. Anæsthetist.

Manchester Ear Hospital, Grosvenor-square, All Saints.—H.S. At rate of £150.

Manchester Royal Infirmary.—H.S. for Central Branch, Roby-street. At rate of £100.

Middlesex Hospital, W.—Whole-time Asst. for Radium Therapy and Research Dept. £300.

Newcastle-upon-Tyne, Hospital for Sick Children.—H.S. At rate of £100.

Norwich, Norfolk and Norwich Hospital.—Cas. O. and H.S. £120.

Oldham Royal Infirmary.—H.P. and Cas. O. Each at rate of £175.

Oxford Eye Hospital.—H.S. £150.

Plymouth Central Hospital.—H.S. £130.

Pontefract General Infirmary.—R.M.O. £200-£300.

Poplar Hospital for Accidents, East India Dock-road, E.—Sen. Res. O. £200.

Queen's Hospital for Children, Hackney-road, E.—H.P., H.S., and Cas. O. All at rate of £100.

Reading, Royal Berkshire Hospital.—Cas. O. and Res. Anæsthetist. Each at rate of £150.

Redhill, Surrey Royal Earlswood Institution.—Jun. Asst. M.O. At rate of £250.

Rotherham Hospital.—H.P. £180. Cas. H.S. £150.

Royal College of Surgeons of England.—Election to Court of Examiners and Professors and Lecturers.

Royal Free Hospital, Gray's Inn-road, W.C.—Asst. M.O. for V.D. Dept. £350. Also Sen. Clin. Assts. for Children's Dept.

St. Mary's Hospital, W.—2nd. Obstet. Surgeon for Out-Patients Dept. Also Res. Anæsthetist. At rate of £101–£150.

St. Thomas's Hospital, S.E.—Visiting Anæsthetist.

Salford City Infectious Diseases Hospital.—Jun. Asst. Res. M.O. £200.

Salvation Army Mothers' Hospital, Lower Clapton-road, Clapton, E.—Asst. Res. M.O. £80.

Samaritan Free Hospital for Women, Marylebone-road, N.W.—Hon. Surg. to Out Patients.

Southampton, Royal South Hants and Southampton Hospital.—Hon. Asst. Phys., Surg. and Anæsthetist to Special Depts.

Stoke-on-Trent, North Staffordshire Royal Infirmary.—H.S. £200.

Taunton, Taunton and Somerset Hospital.—Jun. H.P. and H.S. Each at rate of £100.

Truro, Royal Cornwall Infirmary.—H.S. £170.

University College, W.C.—Bucknill Scholarship 160 guineas. Also 2 Exhibitions each 55 guineas.

Walsall General Hospital.—H.S. At rate of £150.

Warwick County Mental Hospital, Hatton.—3rd. Asst. M.O. £400.

Western Ophthalmic Hospital, Marylebone-road, N.W.—Jun. H.S. At rate of £100.

Worcester General Infirmary.—Jun. H.S. At rate of £120.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Tooting (London) and at Cromarty (Ross and Cromarty).

The Home Secretary gives notice of a vacancy for a Medical Referee under the Workmen's Compensation Act for the districts of the Bedford (Circuit 20), Hitchin, and Luton (Circuit 35) County Courts, and the districts of the Biggleswade, Huntingdon, Peterborough, Thrapston, and Oundle (Circuit 35) County Courts. Applications should reach the Private Secretary, Home Office, Whitehall, London, S.W. 1, not later than May 27th.

Births, Marriages, and Deaths

BIRTHS.

GOVER.—On April 28th, at London-road, St. Leonards-on-Sea the wife of Dr. W. Gover, of a son.

WHITBY.—On April 29th, at Bentinck-street, the wife of Lionel Whitby, C.V.O., M.D., of a son.

MARRIAGES.

GLASGOW—WILSON.—On April 28th, at Park Church, Uddingston, Dr. William Glasgow, Annesbrooke, Swindon, to Agnes Barr Wilson, daughter of the late Sir Thomas Fleming Wilson, K.B.E., and Lady Wilson, Flemington House, Uddingston.

READ—CAMPBELL.—On May 2nd, at the Cathedral, Manchester, John Hodgson, to Mary Caldwell Campbell, M.B., Ch.B., D.P.H., Edinburgh.

SHACKEL—SWANN.—On April 29th, at All Saints' Church, Waldron, Edward Meredyth Shackel, M.B., B.Chir. Camb., to Jessie Elizabeth Gordon, only daughter of Mr. and Mrs. O. H. Swann, of Old Common, Cross-in-Hand, Sussex.

DEATHS.

LAMB.—On April 30th, at Sunnymount, Beechen Cliff-road, Bath, Jessie Lamb, M.B., B.S. Lond., Medical Missionary of the C.E.Z.M.S. at St. Catherine's Hospital, Amritsar, India.

MARSH.—On May 3rd, suddenly, at the Cottage on the Cliff, Sandown, Isle of Wight, the residence of his sister, John James Marsh, M.D., late of Sloane-street, S.W.

NORMAN.—On April 29th, at Wiltshire-road, Brixton, Frederick Norman, J.P., F.R.C.S. Eng., aged 67.

RUSHER.—On April 28th, at the Paddock, Pershore, John Golby Rusher, M.R.C.S.

WEIR.—On May 4th, at Park-road, N.W., Henry Bright Weir, M.A., M.B., B.Chir. Camb.

WILLIAMS.—On April 30th, at "Carisbrooke," Bromley Common, Mary Frances, the beloved wife of John Williams and only child of the late Matthew Henry Hodder, aged 75.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

AN OPHTHALMIC DEPARTMENT AT NORTHAMPTON.—An ophthalmic department for in-patients was last week opened at Northampton General Hospital. It comprises two wards of five beds each for men and women, two private wards of two beds, a small isolation ward, and a theatre.

NOTES, COMMENTS, AND ABSTRACTS

THE MANCHESTER CANCER COMMITTEE.

THE Christie Cancer Hospital in Manchester is the only institution outside London entirely devoted to the treatment of cancer and the study of its cause and prevention. It has joined forces with the Holt Radium Institute and the combined institutions, which both require more space, are building a new department, where the work carried out in coöperation with the Manchester Committee on Cancer and the University of Manchester can be continued. The Manchester committee continues to pay special attention to mulespinner's cancer and the carcinogenic properties of mineral oils. The Anglo-Persian, Anglo-American, and Shell-Mex oil companies have joined in contributing £1000 for two years, in providing crude oils from their wells all over the world, and in preparing in their own research laboratories samples of oils purified in ways suggested by the Manchester staff. The committee has also carried out, at the instigation of the Ministry of Health, an inquiry into the causes of 482 cases of cancer of the skin and an inquiry into the occurrence of intrathoracic cancer. The report for the year 1930 records the results of the researches up to date. The active carcinogenic principle in synthetic tar has now been concentrated to a high degree, but only one definitely active pure compound has been isolated. Its cancer-producing ability is very largely increased by oleic acid, and the effect of heat on this acid is being investigated. It has been found that a very large quantity of acid must be used to detoxicate mineral oils, but the potency can be reduced by as much as 75 per cent. by the use of smaller amounts. Filtration, oxidation, reduction, and exposure to ultra-violet light and radon markedly decrease the cancer-producing potency of oils, but the practical utility of these methods—except filtration—seems doubtful. Mineral oils from petroleum wells vary considerably in their activity, the lighter grades being on the whole somewhat more potent than the heavier engine and cylinder oils.

A MONSTER DIAGNOSTIC CHART.

WE have received from the publisher a copy of a wall chart [1] embodying Dr. Altenhaus's scheme for the complete clinical examination of a patient. The top of the chart is divided into two parts. On the left are full details of the patient's address, occupation, and birth-place; below these, previous illnesses, occupational risks and vices, in the shape of alcohol and tobacco. The right half of this part of the sheet is largely occupied by a diagram for noting the family history in full detail from grandparents to children. The lower part of the chart records the investigation of the present state. On the right side is portrayed diagrammatically the profile of the head, with a full face view of the neck and chest. In and around this diagram are placed particulars of everything to be noticed in the examination of these parts, together with anatomical charts of the front and back of the chest on which are shown the normal limits of the lung resonance. On the left of this lower there are particulars of personal peculiarities, height, colour, shape, and size of head, and every other conceivable detail. Below this the peripheral circulation and the blood are dealt with and the chart is completed by sections for the abdomen with its contained viscera, the urine, and the central nervous system. Every point receives detailed attention; for instance, the blood examination includes a Schilling differential count and a determination of the blood group, while all six of the external ocular muscles are given separate compartments. In relation to these the investigation of the symptoms receives rather scant attention. The chart measures 40 by 28 in. and it is not quite clear exactly for whom it has been designed. From its title and general format it appears to be intended to serve as a guide to the physician or student examining a patient, so that no observation shall be overlooked. If the practitioner is meant to have a stock of the charts and to fill one in for every examination he makes, however laudable the ambition may be it is scarcely practicable since to fill up even one completely would require more than a hard day's work. The chart has been worked out with the utmost care and ingenuity and is a good example of teutonic thoroughness. Let us leave it at that.

BLINDNESS IN PALESTINE.

THE amount of blindness in Palestine is appalling, and there is little evidence of improvement during the last few years. The report of the Ophthalmic Hospital of the Order of St. John of Jerusalem for 1930 makes depressing reading. Of 2396 patients seen in 1930 who were blind in one or both eyes the cause could be traced directly or indirectly to acute conjunctivitis in 79 per cent. The opening of an annexe specially devoted to the treatment of these cases is recorded. During the first six months after its opening 5320 cases of acute conjunctivitis were dealt with, 1497 complicated with corneal ulceration, and 279 of these had already or soon thereafter perforated. The infection was mainly Koch-Weeks, in a certain number it was gonococcal. The great majority attending the annexe were infants and children. In addition to the usual methods of treatment, all the severer cases were given parenteral milk injections, the preparation used being "abijon," the total intramuscular injections given being nearly 500. The benefit was usually marked and it undoubtedly shortened the duration of treatment if given at an early stage. The epidemic season lasts during the five hottest months of the year and during the peak the pressure of work on the staff is severe—ten hours a day actual seeing of patients. Not until the problem of acute ophthalmia is dealt with satisfactorily can the trachoma problem assume manageable proportions, for the one is usually spread by the acute infection of the other. At present the incidence of trachoma is practically stationary, including 91 per cent. of the patients.

FIRST-AID OUTFITS FOR MOTORISTS.

IN anticipation of Safety Week, May 11th to 16th, the British Red Cross Society is putting on the market a number of first-aid outfits for motorists. These are to be available in three sizes at 10*s*. 6*d*., 28*s*. 6*d*., and 42*s*. The first is intended for private cars; the other two are designed to meet the needs of motor-coaches. In addition, a "field dressing" has been prepared at 1*s*. The Red Cross outfits, which are made up in black tin boxes, are intended to contain everything required for dealing with the ordinary road accident, and their contents are all of British manufacture. Specifications are available to manufacturing chemists.

"AFFECTIONS OF THE EYE DUE TO VIRUSES."

IN our report of the annual congress of the Ophthalmological Congress last week Dr. L. H. Savin was said to have described a case of cavernous sinus thrombosis following injection of a vaccine for rheumatism. It should have been stated that the thrombosis followed nine days after vaccination against *small-pox* in a patient who had been suffering from rheumatism. Dr. Savin did not imply that there was necessarily any connexion between the vaccination and the cavernous sinus thrombosis.

BRISTOL INFIRMARY EXTENSION.—The Dowager Duchess of Beaufort recently opened a maids' hostel containing 73 bedrooms. It is intended to double the accommodation for out-patients and to erect a separate building for the resident medical staff.

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[1] Die ärztliche Untersuchung. By Dr. George Altenhaus, formerly Sekundararzt in the Vienna General Hospital. Vienna: Moritz Perles. 1931. Mk.2.50.

ADDRESSES AND ORIGINAL ARTICLES

THE SPLEEN: ITS STRUCTURE, FUNCTIONS, AND DISEASES.*

By J. W. McNee, D.S.O., M.D., D.Sc. Glasg.,
F.R.C.P. Lond.,
ASSOCIATE PHYSICIAN TO UNIVERSITY COLLEGE HOSPITAL, LONDON.

LECTURE III.

We may now consider definite diseases involving the essential structures of the spleen, following the classification which I have suggested.

Infections, Acute, Granulomatous, and Parasitic.

These require no more than mention to bring them into line with other groups in the classification. Acute splenic tumour has already been referred to, while the chief granulomas affecting the spleen are tubercle and syphilis. Echinococcus (hydatid) is the only important parasitic infection, unless aspergillus infection, subsequently discussed, should be included.

Diseases Affecting the Myeloid and Lymphatic Structures.

Myeloid metaplasia is, I believe, a throw-back to the original function of the fœtal spleen as a blood-forming organ. It occurs in a variety of diseases, such as pernicious (Addisonian) anæmia and von Jaksch anæmia, and splenic enlargement, sometimes considerable, ensues. The leukæmias, acute and chronic, myeloid and lymphatic, also involve these structures, but need no more than mention here. In the chronic varieties the splenomegaly may be enormous. There is one case in my experience, which I have already referred to elsewhere, but in which the results of splenectomy were so remarkable that I should like to record it again.

The patient was a woman, aged 66 years, first seen by me in May, 1926, when she was emaciated and obviously dying from a disease classified by the blood picture as chronic aleukæmic leukæmia. The blood count numbered 5400 to 6500 leucocytes, of which 78–82 per cent. were lymphocytes. Splenectomy was successfully carried out at the Royal Northern Hospital by Mr. L. E. Barrington-Ward on July 2nd, 1926. The spleen was enormous, weighing nearly 3000 g., and sections of it, which have been shown to several very prominent pathologists, have always been described as showing the characteristic changes of leukæmia. Following the operation, the woman made a remarkable recovery, has put on several stones in weight, and is still alive and in good health four and a half years after the operation.

It may at first sight seem curious that I do not include the cases of chronic hæmolytic (acholuric) jaundice in this group, but I am satisfied that, so far as the spleen is concerned, it is the reticulo-endothelial phagocytic cells which are active in this disease. It is more difficult to know where to include the spleens from cases of thrombocytopenic purpura, a disease which, as is now well known, may only be curable in desperate cases by splenectomy. I have examined the spleens removed by operation from four cases of this kind, but in none of them could the histological structure of the spleen be described as in any way abnormal. A further point of some clinical interest, and one not always remembered, is that in none of these four cases was the organ enlarged above the normal.

Apart from the lymphatic leukæmias, there would appear to be no special disease in which the lymphatic structures (Malpighian bodies) of the spleen are essentially involved. A possible exception is one of the types of primary sarcoma of the spleen, but this is referred to subsequently.

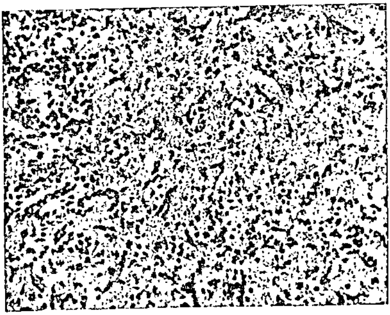
Diseases Affecting the Endothelial Elements (Reticulo-Endothelial System).

This is a most important group, which includes a considerable proportion of the splenomegalies of unknown and uncertain origin. In my previous tentative grouping I included these cases as "reticulo-endotheliosis" of the spleen, and divided them as follows:—

(1) Slight (? chronic infections), and marked.
(2) Lipoidal group—diabetes, &c.
(3) Gaucher-Pick-Niemann group.
(4) Tumours.

I now wish to modify and amplify this early conception, so as to bring it into line with the new classification. Tumours may be excluded, but simply for clearness, since the so-called endotheliomas could still be rightly considered as belonging to this group.

Fig. 10.



Section of spleen from a typical case of hereditary hæmolytic (acholuric) jaundice (low power).

There are three types of splenic disease which may be classified as belonging to this group:—

(1) Chronic hæmolytic (acholuric) jaundice.

(2) Disturbances in the lipoid metabolism of the reticulo-endothelial cells (Gaucher's disease; Niemann's disease; hypercholesterolæmic splenomegaly in diabetes).

(3) Chronic splenomegalies of unknown origin, showing marked proliferation of the reticulo-endothelial cells, and associated with giant cells.

1. *Chronic hæmolytic (acholuric) jaundice*, whether of the congenital or acquired variety, is such a well known disease that it seems quite unnecessary to refer to its clinical aspects. Recent very complete accounts have been given by Eppinger (1920) and Meulengracht (1922). The spleens from this group of cases are seldom enormously enlarged, and have a most characteristic histological structure quite unlike that of any other form of splenomegaly. The pulp spaces are seen to be engorged with red blood corpuscles, so numerous that the actual structure of the

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* The Lettsomian lectures delivered before the Medical Society of London on Feb. 16th and 25th, and March 4th, 1931. Lectures I. and II. appeared on May 2nd and 9th respectively.

organ can only be made out satisfactorily when the spleen has been removed by operation and allowed to empty itself of as much blood as possible before fixation. It can then be seen that the spleen pulp is crowded with erythrocytes of normal appearance, whereas the blood sinuses are relatively empty. In sections stained for iron by the Prussian blue method the spleens can easily be separated into those removed during an inactive or active stage of this hæmolytic disease. In the first instance iron pigment is practically absent; in the second hæmosiderin is abundant, lying chiefly within reticulo-endothelial cells of the pulp and in the large endothelial phagocytic cells lining the blood sinuses.

It may be mentioned here that siderotic nodules, which are referred to in complete detail under diseases involving the vascular system, are by no means uncommon in cases of chronic acholuric jaundice. In one case of this kind, indeed, these nodules were more numerous than in any other spleen of my collection.

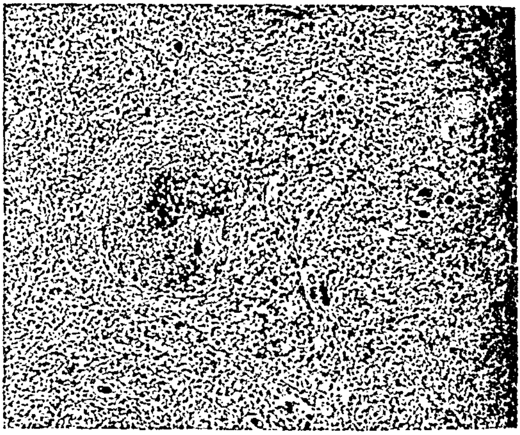
Another curious clinical point in connexion with these cases is the unusual frequency of chronic indolent ulcers of the leg. Such ulcers occur in a number of types of splenomegaly, and it is noteworthy that Stukeley (1722) has some interesting observations to make on this very point. He says (p. 68) "that even Hippocrates knew that ulcers in the legs of such—i.e., patients with splenomegaly—are difficultly healed," and Stukeley refers to a case of his own and to one observed by Mr. Becket at St. Thomas's Hospital.

In view of the histological changes seen in the spleen it is evident that, so far as this organ is concerned, the pathological process consists of a tremendous over-activity of the reticulo-endothelial cells which engulf and destroy the red blood corpuscles. In view of our knowledge of increased fragility of the red blood corpuscles in many, but by no means all, cases of this kind, it would seem probable that the disorder exists in the erythrocytes themselves, and that the splenic enlargement is simply the hypertrophic response of the overworked phagocytic reticulo-endothelial cells. On this view splenectomy may cure the disease by breaking one essential link in an abnormal chain, but the rest of the story is still unknown to us.

2. *Disturbances in the lipoid metabolism of the reticulo-endothelial cells.*—The cases in this group are particularly interesting and puzzling, and, as already stated, it is possible that new careful studies of the relations of the normal spleen to fat metabolism may help in their elucidation.

It was shown experimentally by Anitschkow (1914) that when animals are fed with excessive quantities of cholesterol the cells of the reticulo-endothelial system in the spleen and elsewhere store up immense quantities of cholesterol-ester, and the endothelial cells in ordinary paraffin sections appear large, round, and with "foamy" protoplasm. Clinical observations were ahead of this experimental result, and it was first observed by Coats of Glasgow (1889) that in some cases of diabetes, associated with lipæmia, the spleen pulp was chiefly made up of large finely granular cells, some of them fatty. Coats's work attracted little attention until Schultze (1912) and Niemann (1914) noted and described similar cases. Schultze concluded that the contents of the cells was a lipoid, but being isotropic only and not doubly refractive to light, he believed the lipoid could not be cholesterol-ester. A number of similar cases have been described since then, and two papers of fairly recent origin, from both of which a good account of the literature is obtainable, are by Oppenheimer and Fishberg (1925) and Dyke (1928). The majority of such cases have also shown definite deposits of cholesterol-ester in the skin (xanthoma), and some (e.g., Dyke's case) have been associated with hepatic cirrhosis and jaundice. It is an important point that the lipoid in the large foamy cells of the spleen may not show double refraction to light when viewed through crossed Nicol's prisms, and so confusion with the Gaucher and Niemann types of splenomegaly is possible. Great excess of cholesterol is, however, easily demonstrated by chemical analysis of the tissue, and it would seem that the cholesterol must be bound in some peculiar way to the protein molecule. Graham and Blacklock (1927) have shown that by heating frozen sections in glycerin or water the anisotropic characters of the lipoid may be revealed.

FIG. 11.



Section of a spleen showing marked reticulo-endothelial hyperplasia, with giant-cell formation.

Gaucher's disease was originally described in 1882, and excellent clinical and pathological accounts of it are given by Brill and Mandlebaum (1905), Pick (1926), and Graham and Blacklock (1927). In this disease the reticulo-endothelial cells in the enlarged spleen, in the liver and in the bone-marrow are filled to excess with a lipoid, evidently not cholesterol-ester, but the nature of which is quite unknown. In Niemann's cases the lipoid is apparently different again, but is probably a closely related compound. All of these diseases, as Graham and Blacklock conclude, are presumably the same in type, although the actual lipoids present must differ somewhat in chemical constitution. The splenic enlargement is evidently a reaction on the part of the reticulo-endothelial cells to some abnormal or unwanted product of lipoid metabolism.

In the liver the proliferation of the foamy endothelial cells containing the lipoid may, in any of the cases of this group, be so extreme that necrosis of liver cells and subsequent cirrhosis may ensue. In the bone-marrow collections of these cells may invade the ivory bone (as in an unpublished case which was shown to me by A. R. Rich, of Baltimore), so that an appearance resembling tumour formation results, and pathological fractures ensue.

3. *Chronic splenomegalies of unknown origin, showing marked proliferation of the reticulo-endothelial cells, and associated with giant cells.*—Into this group fall several of the very largest spleens in my collection.

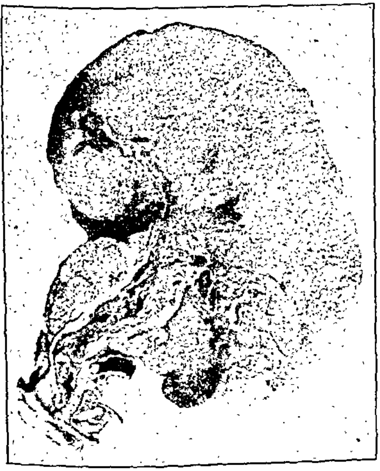
I can do little more than describe the histology, and I have no good explanation of these cases to offer. I suspect that they may be the response of the reticulo-endothelial cells to chronic inflammation of long standing. In several cases of this kind the liver was definitely cirrhotic, but in others I have no information about the liver; so this question must remain open. The histological changes consist essentially of a great proliferation of the endothelial cells, so that the spleen becomes a heavy solid organ and the pulp spaces and venous sinuses are encroached on and partly obliterated. Along with this striking histological alteration giant cells appear, and are sometimes so numerous that the sections almost resemble those from a case of myeloid sarcoma. It has been held by some that these giant cells are megakaryocytes from the bone-marrow, but I am satisfied both from their histological characters and from the results of the oxydase reaction that this view of their origin is incorrect.

Diseases Affecting the Vascular System.

This, in my opinion, forms the largest group of splenomegalies met with in Britain, and I have paid particular attention to it both for this reason and because so many difficulties present themselves for solution. I have already put forward some of my conclusions in considerable detail (1929), and McMichael (1931), working in Prof. Wilkie's laboratory in Edinburgh, has followed up the work in an important paper entitled "Local Vascular Changes in Splenic Anæmia." One section of this group has been the centre of much controversy in recent times, owing to the views, first put forward by Gibson, of Oxford, and later by Emil-Weil, Nanta, Pinoy, and others in France, that the essential splenic lesion is due to mycotic infection.

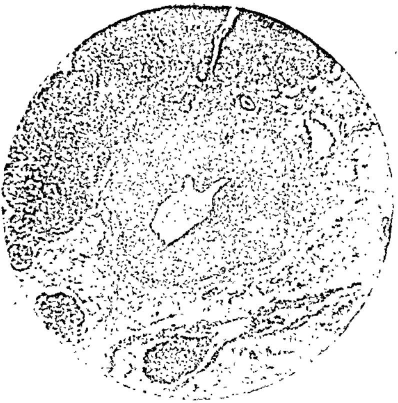
I wish to describe two types of splenomegaly in this group: 1. Thrombophlebitic splenomegaly, in which thrombosis has occurred in the splenic or in the portal vein. 2. Splenomegalies associated with peri-ellipsoidal hæmorrhages and nodular siderosis. The second of these, as I have explained before, cannot be regarded as a true and separate group, since the characteristic lesion is found in a number of quite different types of splenic disease. But the lesion is so remarkable, and discussion concerning its ætiology has been so controversial, that for clearness alone these cases must be dealt with separately.

FIG. 12.



Thrombo-phlebitic splenomegaly. The splenic vein is filled with old and partly tunnelled thrombus. The wall of the vein is irregularly thickened. (From a specimen in the museum of University College Hospital.)

FIG. 13.



Section from the hilum of a spleen removed by operation. Shows great thickening of one of the main splenic vessels (low power).

1. *Thrombophlebitic splenomegaly.*—This group includes the cases in which thrombosis is found either in the splenic vein or in the portal vein and its branches. The splenic enlargement may be enormous, and a spleen of this type is the largest I have ever seen, weighing over nine pounds. These cases have attracted attention for many years, and among the most important papers are those of Dock and Warthin (1904), Dévé (1908), and Warthin (1911). In Warthin's paper a list of nearly 80 references is given, dating back to 1857. Sometimes the thrombosis appears to be fairly recent, and completely obliterates the lumen, but generally the thrombus is old, calcified, and often "tunnelled" so that a partial blood flow has been re-established. There are nearly always calcareous plaques or other signs of degeneration in the wall of the thrombosed vein, suggesting that the clotting has been secondary to chronic phlebitis. Warthin rightly pointed out that in many cases of chronic splenomegaly reported in the literature no mention is made of the condition of the splenic or portal veins, neither of which are usually fully examined in the ordinary necropsy. He states definitely that no example of splenomegaly or "Banti's disease" can be considered seriously in any ætiological study if careful examination of these veins has been omitted. It is also important, in spleens removed by operation, to examine the stump of the splenic vein left distal to the ligature. By doing this I have several times found thickening and even calcification in the small segment of vein, and McMichael also confirms this.

Microscopically the spleens of this group show histologically nothing so characteristic as to be diagnostic, and the chief features made out are a hypertrophy of the spleen pulp associated with generalised fibrosis.

I have noticed that in these cases perisplenitis and adhesions are particularly dense, and unusual difficulties are created for the surgeon by the dense adhesions and also because of the very large size of the *vasa brevia* in the gastro-splenic omentum.

2. *Splenomegalies associated with peri-ellipsoidal hæmorrhages and nodular siderosis.*—The characteristic lesion of this group, the siderotic nodule, has been observed in a considerable variety of conditions in which the spleen is diseased. Jaffé and Hill (1928) have noted it in association with splenic anæmia, hæmolytic jaundice, portal and atrophic hepatic cirrhosis, leukæmia, Hodgkin's disease, sickle cell anæmia, and splenic tuberculosis.

It is, however, as I have stated in a previous paper, one of the commonest findings in chronic splenomegalies examined in this country, and is recognisable at once whenever the enlarged spleen is incised. Scattered over the cut-surface are a number of irregularly shaped yellowish-brown nodules, varying in size from a pin-point to several millimetres in diameter. Each yellowish-brown spot stands out prominently or even slightly projects from the cut-surface of the freshly incised spleen, and each is surrounded by a narrow chocolate-coloured rim. On scraping with the point of a scalpel the nodules are found to be firmly fixed, and can only be torn out with difficulty for bacteriological and chemical examination. On some nodules the knife makes a grating sound, evidently from the presence of lime salts. In other parts of the cut-surface of the spleen abundant small round or oval hæmorrhages occur, unassociated with any central pigmented zone, and on microscopic examination these are found to be hæmorrhages surrounding small arterioles. Diffuse hæmorrhages into the spleen-pulp are common in all forms of splenomegaly, but are readily distinguished with a lens from those surrounding the arterioles. In a few spleens I have found only the small ring hæmorrhages surrounding the arterioles, without any pigmented nodules.

The history of our knowledge of these brownish-yellow nodules is very interesting, but as I have already given it in full chronological detail (McNee, 1929) I have space here only for the briefest synopsis. The first description of them which I have found is that of Stengel (1904) who noticed them in a case of splenic anæmia associated with hepatic cirrhosis. Another very accurate account was soon given by Gandy (1905) under the heading "Lésions particulières de la rate dans un cas de cirrhose biliare." In our country the macroscopic lesion is generally known simply as the "siderotic nodule," but in France it is now often referred to as the Gandy nodule, or Gandy-Gamna nodule, although Gamna's account of two typical cases was as late as 1923. It was Gamna who compared the appearances of the pigmented nodules to "flakes of tobacco leaf."

The characteristic histological features of the fully developed siderotic nodule and of the perivas hæmorrhages have been very fully investigated b among others, Gandy, McMichael, and myself. It interesting to note, however, that some writers as Sprunt (1911) and Christeller and Puskep (1924) have taken up the same problem under headings of "calcium and iron incrustation" "perivascular iron and calcium incrustation" of spleen, unrelated to any questions of splenic or splenomegaly. The fully developed nodule has central arteriole, the wall of which commonly hyaline changes, but the endothelium is hea Surrounding the arteriole is a wide zone of hyal fibrous tissue, in which several varieties of [illegible] may be demonstrated and separated by spe histological methods.

1. Long, segmented, light yellowish green masses, somewhat resembling a jointed bamboo, and often present in sheaves.

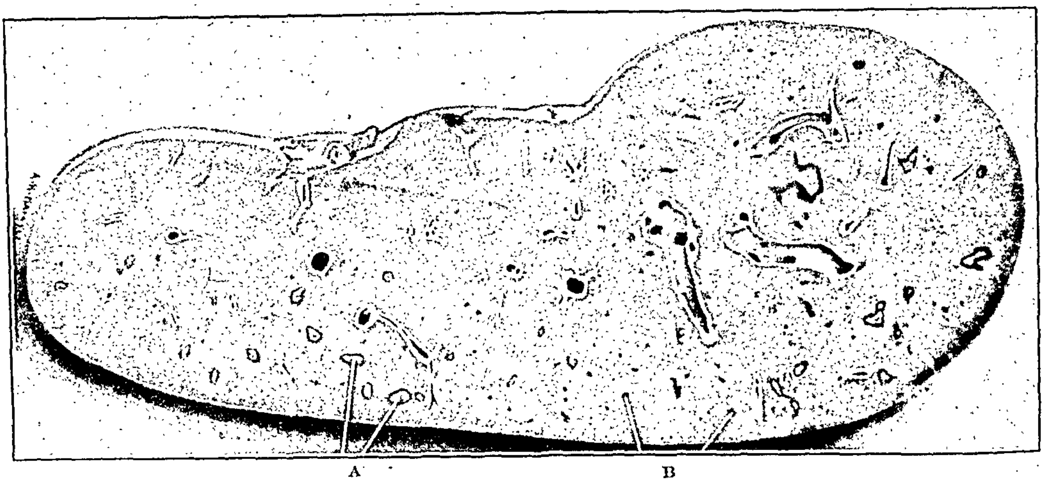
2. Golden-yellow granular pigment, either lying free in masses or contained within the fibroblasts. This pigment gives all the characteristic reactions for hæmosiderin.

3. Amorphous masses, often rounded like grains of starch, which stain blue-black with hæmotoxylin and are evidently calcium.

4. A pigment which stains dark blue with hæmotoxylin and with which the connective tissue fibres are encrusted. This pigment also gives the characteristic reactions for hæmosiderin.

The long segmented yellowish-green masses have

FIG. 14.



Spleen showing a large number of "siderotic nodules." Some very large (A) and of characteristic yellow-ochre colour; others pin-point in size (B). All are surrounded by a brownish ring of hæmorrhage.

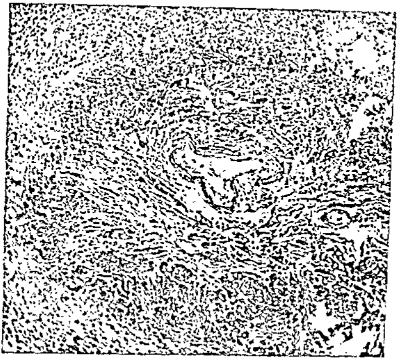
been specially investigated by Sprunt, McMichael, and others, and it now seems almost certain that they are composed of phosphate of iron. Encircling the nodule is a zone of hæmorrhage, in which the innermost layer of red cells is seen to be undergoing disintegration and organisation.

I have paid particular attention to the mode of origin of the nodules, and to their early stages of development. I am satisfied, as indeed was Gandy (1905), that the ring-like hæmorrhages surrounding an arteriole are the early stage of the lesion, and that the hæmorrhage undergoes the ordinary process of fibrosis and organisation. Both the fibrotic nodules and the perivascular hæmorrhages surround arterioles of the finest calibre, and, as has been stated, the vessel wall generally shows definite hyaline change. On attempting to trace the arterioles involved, I was at first unable to account for their apparent abrupt ending in the pulp, until I had learned the peculiar structure and functions of the ellipsoids. It is at or about the termination of a penicillar arteriole in an ellipsoid that both the fibrotic nodules and the hæmorrhages are found, although the hæmorrhage frequently runs back for some distance in the peri-arterial sheath. When the valvular function of the ellipsoid, preventing any flow back of venous blood into the arterioles, is remembered, it seems reasonable to suppose that in conditions of high portal blood pressure or of actual obstruction in the portal venous system a break or rupture is most likely to occur close to the obstructing valve.

In 1913–14, A. G. Gibson, of Oxford, first made the claim that some cases of splenomegaly are due to a streptothrix infection, and quite evidently from all that has subsequently transpired these cases are of the kind associated with siderotic nodules. In his first paper no macroscopic or microscopic descriptions of splenic histology are given, but his attention was concentrated on efforts to prove, by staining methods only, the presence of a streptothrix in the spleens. In two later papers Gibson was able to confirm, by cultural methods, the presence of a streptothrix organism in human spleens.

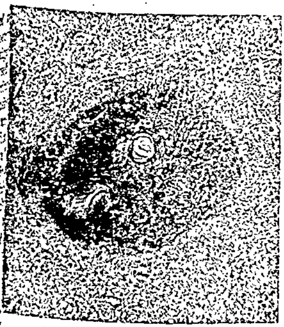
This work remained unsupported until Nanta (1926) described along with Pinoy and Gruny the presence of an aspergillus-like fungus in certain cases of splenomegaly occurring in Algeria. He claimed that the siderotic nodules are characteristic of this fungus infection, and from his cases he was able to isolate the parasite in culture. Support soon also followed from Emile-Weil, Gregoire, and Flandrin (1927) in Paris, who claimed that in 7 out of 16 cases of splenomegaly the same type of mycotic infection could be made out. In the last four years many additional papers on this mycotic hypothesis have been published, some in favour but most against the view. A full account of the matter is given by Gibson (1930) in his recent book entitled "The Mycoses of the Spleen," in which he reiterates his previous views.

FIG. 16.



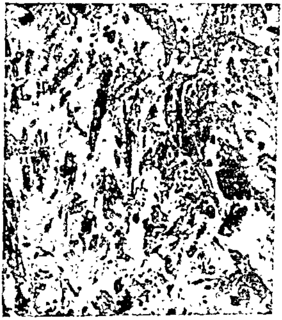
Section of a siderotic nodule (Group 1). Crystals are seen along the lower margin, just within the ring of hæmorrhage (high power).

FIG. 15.



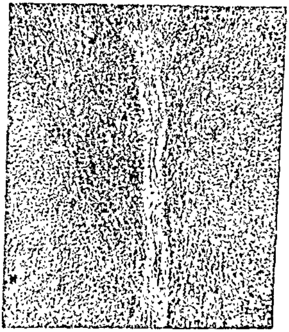
Typical siderotic nodule with central arteriole and narrow surrounding ring of hæmorrhage (low power).

FIG. 17.



Portion of a siderotic nodule, showing crystals and a few small masses of calcium (high power).

FIG. 18.



Peri-arterial hæmorrhage, without fibrosis or siderosis. From a spleen showing in addition many typical siderotic nodules (Group 1) (low power).

I have naturally been greatly interested in this question, but am convinced that all the evidence of mycotic invasion based on histological evidence and on methods of staining mycelium must be discounted, since the degenerated fibres (encrusted with iron), the branching crystals, and the rounded masses of calcium in the pigmented nodules are such obvious sources of error. It is more difficult to pass over the positive results of bacteriological cultures by different investigators, but a point strongly against the view that the organism grown stands in any causal relation to the splenomegaly is that several quite different organisms have been isolated. In my previous paper I felt compelled to leave the question of mycotic infection in this type of splenomegaly sub judice, but all that I have seen and read since then places me in complete opposition to the mycotic hypothesis. The arguments against this hypothesis have been well set forth by McMichael (1931) and I may refer you to his paper.

I have now described the histology of those types of chronic splenomegaly which fall into the old clinical categories of "splenic anæmia" or "Banti's disease." I have hitherto referred to such cases, in my own collection of spleens, simply as "splenomegalies of unknown or uncertain origin," but they now can be fitted very well into the groups of my proposed classification. Our lack of knowledge concerning their ætiology is almost complete. In Group 3 (diseases affecting the myeloid and lymphatic elements) we are faced at once with the puzzle of the leukæmias. In Group 4 (diseases affecting the reticulo-endothelial elements) we must discover much more concerning the metabolic activities of the cells of the reticulo-endothelial system in general and especially those situated in the spleen. Some of the problems for research are quite clear-cut, such as the reason for the excessive phagocytosis of red blood corpuscles in acholuric jaundice, and the explanation of the deposition of lipoid substances, either cholesterol-esters or of unknown nature, in a well-defined group of cases. As regards the splenic enlargements in which enormous proliferation of reticulo-endothelial cells is associated with giant-cell formation, we are so far without a clue. In Group 5 (diseases affecting the vascular system) we must first decide whether the mycotic hypothesis, supported by Gibson and a number of French writers, is true or false. I am opposed to this hypothesis, as I have already indicated, and believe that the solution of this problem is bound up with some other disturbances of the portal vascular system. The two characteristic lesions—phlebitis and thrombosis of the splenic or portal veins, and peri-ellipsoidal hæmorrhages with nodular siderosis—are strong evidence in favour of some form of vascular obstruction. We are still, however, very ignorant of the whole statics and dynamics of the important portal blood-supply, and although the conception of increased portal blood pressure has been mooted by French writers and by myself, there is little or no clinical or experimental evidence on this point. I hope shortly to undertake a study of the portal blood pressure under experimental conditions.

The possibility of unknown poisons, metabolic or bacterial, entering the portal circulation from the intestine must be thought of in all the groups, and particularly in those splenomegalies which are associated with hepatic cirrhosis. In the reticulo-endothelial group (Group 4) we do know that in, for example, Gaucher's disease the same lipoid substance may be deposited in the endothelial cells of both spleen and liver, and as a result the glandular cells of the liver may undergo necrosis. In the other groups, however, the cause of the hepatic damage ending in cirrhosis remains quite unknown, and at present we can only keep in mind the two possibilities of increased portal blood pressure and the entry of toxic substances from the intestine.

Tumours of the Spleen.

Simple tumours of the spleen are excessively rare. Litten describes fibromas, hæmangiomas, and lymphangiomas, but the last two might well be described as malignant. Primary malignant tumours are also rare, but when they occur are always sarcomas, and primary carcinoma of the spleen almost certainly does not exist.

The uncommon incidence even of secondary malignant growths in the spleen is well shown in a paper by Krumbhaar (1927), who summarises the results of the necropsies at the Philadelphia General Hospital. Among 17,500 necropsies 96 splenic neoplasms were found; but since the early records were unsatisfactory he confines himself especially to the last 6500 cases. In this latter group 40 splenic tumours occur, 6 being primary (4 sarcomas, 1 hæmangioma, 1 lymphangioma) and 34 secondary of all types including 21 carcinomas.

Sarcoma of the spleen is really the only important primary tumour, and both Smith and Rusk (1923), and Tasker Howard (1929) have written important papers on the subject with full bibliographies. Tasker Howard collected, up to the time of his paper, 115 cases from the literature, and added a further case of his own. Some important clinical details of his own patient are given. The spleen was large (1800 g.) and partially necrotic, but the remainder was almost entirely replaced by sarcomatous tissue. Clinically the patient closely resembled a case of pernicious anæmia, with high colour-index, leucopenia, achlorhydria, and a marked indirect van den Bergh reaction. Irregular pyrexia was present during the greater part of the illness.

The first example of sarcoma of the spleen seen by me was exhibited by Dr. Joan Ross at a meeting of the Pathological Society of Great Britain, where it attracted much attention. Since then I have had two cases in my own experience, one of them a woman of 58 (a patient of my colleague, Dr. Charles Bolton), and the other a man of 70 years. It is hoped to describe these two cases elsewhere, so I do not propose to enter into details about them now. All I need say is that there is great difficulty in determining whether these cases should be described pathologically as lymphosarcomas or endotheliomas, but this after all is a purely academic matter.

Diagnosis and Prognosis of Splenic Diseases.

It would take far too long to enter into a detailed discussion of all the points, clinical and clinico-pathological, on which an accurate clinical diagnosis of one or other type of splenic disease may be attempted. But, in actual fact, an accurate clinical diagnosis and classification is for the most part impossible at present. It will be agreed that the spleen is always enlarged when a suspicion of disease in it begins to be entertained, if we leave out the exception of thrombocytopenic purpura.

One type of splenomegaly in chronic hæmolytic (acholuric) jaundice can generally be picked out by methods now quite familiar. Spleen puncture is possible, but many of us are chary of employing it. Graham and Blacklock have, however, practised this method with success, particularly for the accurate diagnosis of Gaucher's disease, and they give a very complete and valuable account of the technique they have employed.

On the whole, however, the diagnosis during life can often only be made by the therapeutic measure of splenectomy.

Prognosis of splenic diseases.—The prognosis of most of the types of chronic splenomegaly met with in this country is, on the whole, unfavourable to prolonged life. An exception to this is chronic hæmolytic (acholuric) jaundice, but even in this disease the patient has to run the gauntlet of a number of complications such as gall-stones and biliary colic.

Cases of splenomegaly usually die from complications, and of these the most dreaded, but difficult to recognise in its early stages, is hepatic cirrhosis. I am unable to say what proportion of cases end with this complication, but obviously figures on the matter would be valuable.

Apart from hepatic cirrhosis and its well-known train of signs and symptoms, the other complications most to be feared are hæmatemesis, widespread abdominal thrombosis, and the onset of the "hæmorrhagic diathesis."

Splenectomy.

The indications for splenectomy have been already referred to indirectly in the section on diagnosis. There are only two points remaining which I wish to emphasise.

First, there are cases (such as Gaucher's disease) in which, if we knew the exact diagnosis beforehand, it would be inadvisable to remove the spleen, but on the whole the cases of splenomegaly in which removal of the organ offers the best hope of cure far outnumber the others. Secondly, splenectomy may be successful even in the most desperate and unpromising cases. I recall one patient in whom life, with good health, was prolonged for seven years, although prior to splenectomy over 100 pints of fluid had been removed from the abdomen. This patient, moreover, died of chronic interstitial nephritis and uræmia, a renal lesion being known to exist at the time of the operation. At the necropsy on this case the portal vein was found to be completely thrombosed.

Certain precautionary measures are very necessary before operation is considered. The first of these is concerned with the degree of anæmia present, and if anæmia is at all pronounced I am a confirmed believer in blood transfusion either before, during, or after operation, and sometimes even at all three times.

The second necessary precaution is one which I learned from the work of Howel Evans (1929), who brings out the great importance of blood-platelet counts in cases of splenomegaly prior to operation. Howel Evans began his observations following a paper by Rosenthal (1925), who described the results of splenectomy on 16 cases of splenic anæmia. Three patients died in the first year of widespread portal thrombosis, and three others suffered from venous thrombosis, fortunately not fatal, in different venous trunks. In the last nine cases Rosenthal carried out blood-platelet counts before and after operation, and on his results divided the nine cases into two groups.

(a) *Thrombocytopenic group*—five cases. In these patients the blood-platelet count was low before operation, rose slightly afterwards, then fell to normal. A clinical feature of all of these cases was a marked hæmorrhagic tendency.

(b) *Thrombocythæmic group*—four cases. In these the blood-platelets were normal or slightly subnormal before operation, but rose rapidly to high figures (1,000,000 or more) after splenectomy, and, moreover, the increase persisted for months or years. All of these four cases developed thrombosis; one a fatal mesenteric thrombosis, the others thrombosis of the brachial, jugular, and femoral veins respectively.

Howel Evans has confirmed these observations in a series of 19 cases, of which 9 fell into group (a), 7 into group (b), while 3 gave intermediate results.

From these observations it is obviously important to study the blood-platelet count before and after splenectomy in all cases, in reference to both prognosis and treatment. Only a lead, however, has been given, and so far we are unable to modify the conditions found; but it must be remembered that both thrombosis and a hæmorrhagic tendency are equally dangerous, and we must attempt to discover means to prevent them both.

Are there any alternatives to splenectomy? Two methods of treatment must be considered—the use of X rays in some diseases, and ligature of the main splenic artery in others.

It is difficult to discuss briefly the merits of X ray treatment of an enlarged spleen, particularly in cases in which no accurate clinical diagnosis has been made. There is, however, one group of cases in which this treatment offers the best results at present attainable—namely, the chronic leukæmias, especially of the spleno-medullary type. Our methods of treating these cases by X rays, controlled carefully by regular blood counts before and after exposure to the rays, have quite obviously improved in recent years, and I have two cases under my care at present in which the outcome, so far as prolongation of life and return to good health are concerned, can only be described as amazing. I have seen nothing like them in my past experience of leukæmia, which is considerable. Similar results must be known to most of you, but the belief that the great improvement is only for a limited time is well founded. In Hodgkin's disease temporary improvement may also ensue, but not, in my experience, so great or so prolonged as in the leukæmias. The chief danger of X rays in these cases, now that burns are avoidable, is an undue destruction of the leucocytic tissues so that marked leucopenia results and septic complications may ensue. This danger is particularly to be feared when X ray exposure of other parts of the body, such as the bones, lymphatic glands, and mediastinum has also been carried out. It must be remembered that the effects of a single exposure to X rays may be prolonged and long drawn out, so that nothing but a series of careful blood counts can avoid this error in treatment.

Ligature of the main splenic artery is a method which, with the help of my surgical colleagues, I much desire to test in suitable cases of chronic splenomegaly. So far I have no personal experiences to relate, but the operation is apparently quite safe and by no means a new suggestion. A full account of the literature is given in a recent paper by Valdoni (1929). I can think of several types of case in which this simpler operation might have been performed instead of splenectomy, and certainly this procedure should be considered seriously when dense and extensive retrosplenic adhesions greatly increase the surgical risks of removal of the spleen.

The subsequent history of patients from whom the spleen has been removed for the various types of chronic splenomegaly is of obvious interest, but my experience is not yet long enough to tell you much of importance. Most of my cases have done well, and most of them are still alive. I have alluded to the two cases in which carcinoma developed, and I have been fortunate in having no examples of thrombosis at a long interval after operation.

There is one further point to which I ought to refer. It will be remembered that, as Krumbhaar and Musser showed experimentally, removal of the normal spleen in animals is followed by a secondary anæmia, often of long standing. The same phenomenon may occur after splenectomy for a number of the splenic diseases which I have described It is not always so, and the blood count may return to normal, but in a number of patients intermittently under my observation at present the blood count remains at about two-thirds of the normal, although the patients themselves can perform all ordinary duties and feel reasonably well.

Conclusion.

In concluding these lectures I must emphasise my ignorance of the causation of the splenic diseases which I have described. The spleen still remains, in Galen's words, an organ of mystery both in its diseases and in many of its functions and metabolic activities.

The organ is not essential for life, and practically no direct gain in physiological knowledge has resulted from splenectomy in man or animals. Unlike the thyroid or pancreas in which striking clinical phenomena follow excision, there are no special facts to be noted when splenic function is arrested by excision or even by disease. It is evident that advances in our knowledge of splenic physiology must come in less direct ways.

I am convinced that, while waiting for advances in physiology, a further obstacle to progress has been a poor general knowledge of the essential structure of the organ, and I have shown how recent physiological experiments have assisted us even in the interpretation of structure as well as of function.

With accurate knowledge of structure, even when problems of function remain unsolved, it is possible to examine diseased spleens and to observe and interpret the histological changes which have taken place. In this way a *pathological classification* can be made according to the chief lesions, and this is what I have attempted to do and to describe in these lectures.

I have suggested how, from the peculiarities of some special lesion, a strong lead may be given to further study. The histological changes in Gaucher's disease, to give one example, invite us to investigate more closely the relations of the spleen to the metabolism of fats and lipoid substances.

It is only, however, when our knowledge of splenic function is increased by observation and experiment that we may expect to correlate disordered function with bodily disorders which we recognise by clinical symptoms. Then, and only then, can we attain to a *clinical classification* of splenic diseases.

I hope that after long years of inactivity and stagnation the recent physiological experiments of Barcroft, Binet, Tait, and others mark a new period of progress in the study of "The Spleen, its Structure, Functions, and Some of its Diseases."

Many friends both here and in America have helped me by sending spleens, or parts of them, and clinical histories of their patients. I wish to thank them all, and to acknowledge the special assistance I have received from my colleagues at University College Hospital.

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THE SURGICAL TREATMENT OF SIMPLE ULCERS OF THE BODY OF THE STOMACH.

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IN the last few years there has been a great revival in the medical methods of treatment of chronic gastric ulcers, and to-day many claim that all uncomplicated ulcers are capable of being cured by these methods. This form of treatment is by no means new. In 1902 the late Dr. F. J. Smith was strongly advocating the use of milk diet with the regular administration of alkalis, and it is remarkable how closely his technique corresponded to that advocated to-day. The majority of these cases improved and lost all their symptoms, but it was gradually realised that the apparent improvement was in a large number only the passage into one of the usual periods of remission, and that when this period had passed through its customary time the symptoms returned. So much evidence was produced that with this treatment there was still a high mortality from hæmorrhage and perforation that it was gradually abandoned and treatment by surgical measures became usual. Undoubtedly, the pendulum swung too far, and operations were performed for small ulcers in their early stages when they were still capable of being cured by medical methods. What was more serious was that the operations came to be regarded as simple procedures, and thus were often inadequately performed by those with but little experience. Gastric surgery had thus somewhat unjustly tended to fall into disrepute.

Efficacy of Medical Treatment.

There is to-day, as always, considerable difficulty in comparing the two methods of treatment—that is, in determining the indications for surgical interference.

Much has been written in favour of either method, but it is almost impossible to obtain reliable evidence from the various publications; for so often they refer to ulcers of different types in different stages of development, and I should be the first to admit that even one's own experience is fallacious, for although nearly all the cases that seek my advice have had prolonged courses of medical treatment they of necessity only represent the failures of such a method, and I have no means of determining what percentage they form of the total so treated. In the same way the surgical failures reported by physicians may and probably do represent only a very small proportion of the number that have been successfully treated. For this reason I shall make no quotation from the large number of statistics which have been published, but shall attempt to show from a consideration of my own cases (Tables I. and II.), which are in greater part medical failures, what are the indications for surgical interference. It is, however, well to remember that the late end-results of a large series of cases treated medically have never been published, whereas the percentage of cures in large series that have been operated upon for at least five years is fairly accurately known.

TABLE I.—*Gastric Ulcers.*

	Males.	Females.	Total.
Lesser Curve—			
Non-adherent	136	43	179
With duodenal	26	6	32
Adherent	150	53	203
With duodenal	19	7	26
Hour-glass	1	75	76
Gastro-jejunal	47	4	51
Recurrent	8	—	8
Perforated	31	6	37
After suture	3	6	9
Severe hæmatemesis	7	2	9
Recurrent after G.E.	77	7	24
Acute	11	19	30
	456	228	684

TABLE II.—*Pyloric and Duodenal Ulcers.*

	Males.	Females.	Total.
Pyloric—			
No dilatation	82	15	97
Dilatation	74	27	101
Duodenal	403	79	482
Perforated	26	1	27
After suture	21	2	23
Severe hæmatemesis	6	1	7
Acute	13	2	15
	625	127	752
Gastric	456	228	684
	1081	355	1436

RELIEF OF PAIN.

As a general rule a patient with an ulcer of the body of the stomach presents a history of several years' periodic attacks of pain, often severe in nature, which arises shortly after a meal, is relieved before the next meal, and unlike that of a duodenal ulcer does not generally wake the patient at night. Examination shows, as a rule, a healthy male, perhaps with some anæmia, who has few or no physical signs beyond an area of deep tenderness localised to the site of the ulcer. A test-meal shows free HCl and a total acidity within the upper limits of normal. The stools may show occult blood, and radiography generally reveals a characteristic niche in some portion of the lesser curve or a meniscus remaining on the posterior surface after the stomach is emptied.

Without entering into a discussion of the various views as to the cause of the pain, I can say that my own experience supports the views of V. J. Kinsella, that both the pain and deep tenderness are dependent upon local tension due to an acute inflammatory change which after persisting for a certain period dies down, and the patient then enters into one of his periods of remission, during which, however, the ulcer is still present. It would be expected, therefore, that medical treatment would do much to decrease this inflammatory change, and thus to relieve the patient of his symptoms. Changes in the radiographic appearance of the meniscus must not, however, be relied upon too strongly as an indication of a cure; for, as A. E. Barclay has shown, the depth of the niche is largely dependent upon an inflammatory swelling of the mucosal margin, and as this decreases the pit or crater rapidly decreases in depth and the ulcer appears to be healing, although it is still present. My own experience has been that very severe pain, and especially pain which tends to persist and is referred to the back, is evidence of a deeply penetrating ulcer which has involved the substance of the pancreas, and thus not only is a severe and persistent pain an indication against the use of medical treatment, but such treatment often indeed fails to relieve the symptoms. A prolonged history extending over many years suggests a chronic callous ulcer with much fibrosis which is unlikely to be cured by prolonged rest and alkaline treatment, and is thus in itself an indication for surgical intervention. A very large crater as seen by examination with X rays is suggestive of similar change, but is not definite; for in some cases a thorough medical course may relieve the symptoms and lead to a rapid diminution in the size of the crater, so that even if a cure is not attained diminution of the inflammatory change may lead to much improvement, and the necessity for less severe operative measures. Definite evidence of the failure of careful treatment to relieve the symptoms, or a rapid recurrence after relief by such treatment is a positive and indeed the most common indication for surgical interference. It is true that in a certain number of cases the recurrence is due to the fact that the treatment is not followed for a sufficiently long time. Many physicians advocate a most careful dietetic and alkaline régime for many months or, indeed, for the rest of the patient's life, but the mere fact that such a course is so irksome or difficult that the patient is unable to follow it while carrying out the ordinary duties of his life's work is an indication for more radical measures. I have found within the last year that an increasing number of patients who have been relieved by a course of diet and alkalis are seeking surgical aid because they have found it impossible to maintain the irksome medical treatment, and when it is abandoned their symptoms have tended to recur. Nor is such treatment even to-day entirely free from danger. Morton, writing of a series of 139 proved chronic ulcers treated at St. Thomas's Hospital in 1929, states that 13 were verified at autopsy.

PERFORATION AND HÆMORRHAGE.

Undoubtedly the greatest dangers of a peptic ulcer are perforation and hæmorrhage. That an immediate operation should be undertaken in the event of a perforation is beyond question, but there is not so much unanimity of opinion in cases where a perforation has been operated upon and sutured without any other procedure. I have frequently laid stress upon the fact that cases treated by simple suture rarely make a complete recovery. Such a case should, therefore, always be carefully watched, and if the symptoms recur further treatment should be advocated. I have now had to operate upon 32 cases where symptoms have recurred after a simple suture for perforation, and these symptoms have not been relieved by medical treatment; but here again I have no means of determining what proportion these represent of the total number sutured. It has been, however, interesting to find that when the simple suture has been performed by my own assistant at hospital, and the case has then been watched, there has not been a single recovery from this measure. If a patient has been fortunate enough to have passed safely through the danger of a severe hæmorrhage he will rarely be willing to face the danger of a second and will seek operative treatment. Continued loss of blood while he is under medical treatment is evidence that the condition is not abating, and this is so even when the loss is very small and is only recognised as occult blood in the fæces; in fact the presence of such blood should always be regarded as an urgent danger-signal, and an operation performed without delay in order to anticipate a severe and dangerous hæmorrhage. There is still considerable difference of opinion as to the correct treatment in patients who, being evidently the subjects of chronic ulceration, are seen immediately after or during a severe hæmorrhage. Many physicians believe that the danger of operative interference is very great, and that if the patient be carefully treated by medical measures death rarely occurs. My own experience does not entirely support this view, and although there are many cases which will recover I feel that if there be any doubt, or if the hæmorrhage be repeated after a short time, an operation should certainly be performed, preferably immediately after or during a blood transfusion.

When the ulcer has led to so great an amount of fibrosis that distortion of the stomach has occurred, mechanical symptoms may arise from the distortion itself. The commonest of such changes is that of an hour-glass stomach. This only occurs in women, and generally in those who are the subjects of ptosis. It is associated with so characteristic a history that a diagnosis is rarely difficult even without radiography. In such conditions medical treatment is of no value, and an operation should be undertaken before obstruction has caused profound deterioration in the general health.

CANCER.

Beyond question the great objection to prolonged medical treatment is that it may be carried out when carcinoma of the stomach is present, and thus the one opportunity of a cure is lost. The recent fierce controversy as to the frequency of carcinomatous changes in a chronic ulcer is now abating, and it is becoming generally accepted that some 10 per cent. of chronic ulcers become carcinomatous, and that rather less than 20 per cent. of the carcinomata originate in chronic ulcers. The real danger which is so often overlooked is that cases which are carcinomatous in the beginning may be mistaken for chronic ulcer and treated by medical methods until the condition is inoperable. Even to-day, of the cases of carcinoma that come to operation, only about 33 per cent. are capable of radical treatment. The fact that one type of chronic ulcer of the lesser curve has a continuous short history of only a few months, and thus superficially resembles a carcinoma, increases this difficulty. Fortunately, a carefully taken history will nearly always give some indication that the lesion is either primarily carcinomatous or that a carcinomatous change has taken place in a chronic ulcer. The most important of such points are a short history, continuity of the symptoms, persistence of the pain from one meal to another, a gradual loss of appetite, and the failure of vomiting to give relief to the pain. If there be anything in the history to cause the merest suspicion of the presence of carcinoma, an operation should always be performed.

The indications for operative treatment are therefore:—

The presence of severe radiating pain as indicating a deep penetrating ulcer.

The failure of medical treatment to relieve the symptoms.

The presence of a very long history suggesting a fibrosed and callous ulcer.

Recurrence of symptoms shortly after an adequate course of medical treatment.

Inability of the patient, owing to the nature of his work to follow the suggested lines of treatment.

The presence of a recent or old perforation.

The onset of severe or repeated mild hæmorrhage.

Distortion and especially hour-glass deformity of the stomach from fibrosis.

The slightest suggestion of the presence of carcinoma.

Surgical Procedures.

It is often forgotten that the underlying aim of an operation upon the stomach is to bring about certain physiological and mechanical changes, and that these changes may be produced by entirely different methods; so that one surgeon by using a technique which he has perfected finds that it gives him better results than a different technique preferred by a second surgeon. Forgetfulness of this fact has often led to heated discussion as to which is the correct operation, and thus has done much to discredit surgical treatment. My advocacy of any one method must therefore in no sense be regarded as a dogmatic statement as to which is the ideal treatment, but simply an account of the method which has given the most satisfaction in my own hands.

GASTRO-ENTEROSTOMY.

It is not very many years ago that gastro-enterostomy was considered as the operation of choice for all ulcers of the body of the stomach, and there are still surgeons who prefer it to other methods and obtain satisfactory results by its use. In my own hands, and, as a study of the literature shows, in the hands of most other surgeons, it has not proved a reliable cure. It is generally stated that it cannot be depended upon to cure the patient in more than about 40 per cent. of the cases. In my own small series of 57 chronic ulcers other than perforations, there were seven in which the ulcer persisted (Table III).

TABLE III.—*Gastro-enterostomy.*

	Total.	Mortality.	Recurrence.	Carcinoma.
Lesser curve	41	—	4	1
Anterior	13	3	—	—
Severe hæmatemesis ..	3	—	3	—
	57	3	7	1
Acute ulcers	17	5	—	—
Perforations	30	7	—	—
	104	15	7	1
Post G.E. for all simple ulcers	600	12	5	2

It is interesting to note that in my series of 30 cases of lesser curve perforation, where the opening was sutured and a gastro-enterostomy was performed. there has not been a single example of persistence of the ulcer. I would explain this on the assumption that the suture of the perforation acts as an autolytic stitch resection, and so destroys the ulcer. It is not in my experience due to the fact that the perforated ulcers are acute and do not require any treatment other than suture, for in my series there have been 32 cases of perforated ulcer which have persisted after simple suture as performed by other surgeons, and what is even of greater interest is that occasionally an ulcer may develop in the body of the stomach after a gastro-enterostomy has been performed for a pyloric or duodenal ulcer. In my own series there have been 14 cases where the evidence was very strong, that there was no trace of any such ulceration at the time of the gastro-enterostomy. If such a procedure, therefore, is unable to prevent the development of an ulcer it is even less likely to cure it when present. It is, however, curiously uncertain in its action. Occasionally there is found at operation a very large ulcer situated high up on the lesser curve of the stomach with acutely œdematous margins. Owing to the risk of partial gastrectomy for so extensive a lesion, often in a patient seriously debilitated by severe pain, vomiting, and hæmorrhage, it is my custom to perform a gastro-enterostomy alone, and in five such extensive cases the ulcer after this simple treatment decreased so much in size that the patient remained free from symptoms for as long as a year, after which time the ulcer was so small that a resection was a feasible and safe operation. I believe that this is a much more satisfactory form of treatment than the performance of a jejunostomy or of partial gastrectomy which will have to be so extensive that it is almost complete and is a dangerous operation in so ill a patient. In some such cases the ulcer—large as it is—has completely disappeared and no second operation has been necessary. It is cases of this type which explain the apparent cures of gastric carcinoma after a simple gastro-enterostomy.

PARTIAL GASTRECTOMY.

Undoubtedly the operation most frequently performed to-day for an ulcer of the body of the stomach is that of partial gastrectomy. It is claimed that by this method not only is the ulcer removed entirely but that the ulcer-bearing portion of the stomach is also taken away, and thus the risk of recurrence of the ulcer or of subsequent carcinoma is greatly reduced. It is to be noted that the ulcer-bearing portion is almost, if not quite, synonymous with the acid-secreting portion of the stomach, and thus by this operation the acid is reduced or completely abolished. I cannot help feeling, however, that this latter claim is based upon some confusion of thought, for ulcers of the body are not as a rule associated with a very high acid, and thus it is that gastro-jejunal ulcers following a gastro-enterostomy performed for this type of lesion are almost entirely unknown. In my own series of 59 gastro-jejunal ulcers only one occurred after an operation for a lesser curve ulcer. Moreover, a partial gastrectomy does not give an absolute immunity against a later gastro-jejunal ulcer. In my own 59 cases, four had followed a partial gastrectomy although in the one case performed by myself I had had to be content with a smaller resection than usual owing to dense perigastric adhesions. For this reason some Continental surgeons, among whom the operation is most popular, have abandoned the Polya method and returned to the Billroth I. type of operation. There is no doubt that with experience the method becomes technically easy to perform and can be carried out for relatively large ulcers high up on the lesser curve, especially if modified as in the Schoemaker and Pauchet's method. It also gives very satisfactory results, the convalescence generally being smooth and rapid, and the freedom from after-complications being very satisfactory. Although in my own hands the results have been very pleasing, I have for long been theoretically dissatisfied with it, in that so large a portion of normal stomach has so frequently to be removed. It is often necessary with a small ulcer, perhaps only half an inch in diameter but situated high up on the lesser curve, *to remove seven-eighths of the stomach.* These objections are not wholly theoretical, for it is now well recognised that pernicious anæmia is dependent upon the absence of a gastric ferment, partial gastrectomy having in several cases been followed by this form of anæmia. Morley and Roberts have shown that the Polya operation carries with it a serious liability to post-operative anæmia, 12 of the 21 cases they examined showing such a change. This liability was, however, much less with the Schoemaker method. In my own series of 388 partial gastrectomies only one has developed a serious anæmia, which Dr. J. A. Ryle informs me may turn out to be of the pernicious type, but several cases who have had profound secondary anæmia from hæmatemesis before operation have taken a very prolonged period to recover after a partial gastrectomy. The value of this method in preventing the possibility of the onset of later carcinoma has also, I believe, been exaggerated. The frequency of a carcinomatous change in an ulcer is now known to be less than was at one time believed, and as a general rule such a change will often give rise to an alteration in the symptoms sufficient to suggest the possibility of the presence of carcinoma, so that should there be the slightest suspicion of such a change either from the nature of the symptoms or from the appearances at the operation, a partial gastrectomy should be performed. That the danger of such a complication occurring late is not great is shown by the fact that in my own series of 306 cases, in which a more localised operation was alone performed, there have only been three examples of the later appearance of carcinoma (Table V.), one of which was at the pylorus and another at the cardiac orifice; only one having occurred in relation to the previous ulcer site, and in no case has carcinoma been found in one of the locally removed ulcers.

TABLE IV.—*Partial Gastrectomy.*

	Total.	Mortality.
Lesser curve	141	21
Hour-glass	45	2
Gastro-jejunal	42	13
Recurrent ulcers	18	2
	246	38

Recurrence and gastro-jejunal ulcers, nil in each instance.

TABLE V.—*Resection and Gastro-enterostomy.*

		Total.	Mortality.	Recurrence.	Carcinoma.
Lesser curve	excision .	244	9	1	3
	cautery ..	34	1	2	—
Hour-glass ..	..	28	2	1	—
		306	12	4	3

In some cases of large adherent ulcers relatively high up, but neither so large nor so adherent as those for which a gastro-enterostomy is alone performed, a partial gastrectomy is the only possible operation. There is no doubt that in such cases this operation is easier to perform than a local resection, as it gives much better access to the ulcer and allows of a more satisfactory approach in order to free it from the pancreas. The actual method of performing the partial gastrectomy is, I believe, of but little importance provided the surgeon has practised the method he advocates. My own preference is for the original Polya method with the afferent loop attached to the lesser curve and the opening being some four to five inches from the duodeno-jejunal flexure, but the antecolic method either with the Balfour or Moynihan loop is quite satisfactory, and I frequently use it if the mesocolon is short. For a gastro-jejunal ulcer, where the opening in the jejunum is already made and is generally close to the flexure, I have no hesitation in performing the posterior method with the afferent loop going to the greater curve. The procedures of Schoemaker and Pauchet, which give very similar end-appearances, are performed by many, as they remove more of the lesser and less of the greater curve, but here, as elsewhere, I believe that surgeons will obtain the best results by the use of procedures in which they have been most practised.

LOCAL RESECTION AND GASTRO-ENTEROSTOMY.

The practical drawbacks of simple gastro-enterostomy and the theoretical objections of partial gastrectomy would seem to be best overcome by local destruction of the ulcer combined with gastro-enterostomy. There appears, however, to be a very wide diversity of opinion as to the value of this operation. On the Continent a partial gastrectomy has always been the method of choice, and in this country many others are adopting the same method, probably because of its wide applicability. In the United States local excision with gastro-enterostomy have been widely practised in the Mayo Institute, either by the method of simple excision or of late more largely by Balfour's method of cautery excision. From the theoretical consideration it has the great benefit that it removes the diseased portion and that only; that it has a low mortality and it gives a high percentage of successful results. By completely excising the ulcerated area the possibility of perforation or hæmorrhage from the eroded vessels is overcome, together with the danger of hour-glass constriction or deforming adhesions from contraction of the ulcerated area. The objection that it does not remove the whole of the acid-secreting area is of but little importance with an ulcer of the body of the stomach, for in these cases there is not the same high acidity as with a pyloric or duodenal ulcer. My own preference is to remove the ulcer widely with the knife and scissors by means of a wedge with its base on the lesser curve and to suture the resulting opening. If the wedge be made with a sufficiently wide base an early hour-glass constriction can actually be overcome. For small ulcers high up on the posterior surface this method is not easy to accomplish, and therefore Balfour's technique of destruction with a cautery is preferred, although I have always felt that this means is not quite so satisfactory in that the edges which are left to unite are formed of more injured tissues. When the resulting opening left by either method has been closed a gastro-enterostomy must be performed, for without it recurrence is common and is indeed to be expected, for the conditions which give rise to the ulceration of the normal surface are more likely, if uncorrected, to do so on a recent suture line. My own custom in this type of case is to make the gastro-enterostomy on the posterior surface parallel with and close to the greater curvature, half being proximal and half distal to the line of suture. Since this opening is often relatively high up in the stomach, it would seem preferable to temporarily occlude the pylorus, and it is my invariable rule to do this with a running silk suture. Observation of cases in my follow-up department has shown that after it the pylorus usually opens again in from six to eight weeks.

The chief objection which has been raised to this operation is that there is a risk of recurrence. It is, however, very slight. In my own series of 244 cases there has only been one recurrence. In my own hands I have found this operation the method of choice and invariably performed it where possible, chiefly on the grounds that it is associated with a low mortality and a higher percentage of complete recovery than with any other form of gastric operation. I reserve partial gastrectomy for large adherent ulcers, for those in which there is the slightest suggestion of carcinoma, and for cases of hour-glass constriction with a very narrow isthmus.

Results of Operation.

The great benefit of posterior gastro-enterostomy lies in its extreme safety. In my own series of 690 cases of posterior gastro-enterostomy the total mortality was under 2 per cent. (Table III.), while in a later series of 290 cases in this group there was no mortality, and in the small group of 41 cases of ulcer of the body of the stomach in which this step was alone performed there were also no deaths. When an anterior anastomosis has to be performed owing to the very large size and acuteness of the ulcer on the posterior wall, the mortality is naturally higher, my own 13 cases showing three deaths. Although the safety of the operation is an important factor in choosing the operative treatment for patients with very large ulcers who are seriously ill from prolonged pain and vomiting or severe hæmorrhage, it is largely offset by the risk of persistence of the ulcer, for, as I have already pointed out, this occurred in seven of the 57 of my own cases which had to be treated by this method.

The statistical comparison of the results of partial gastrectomy and local resection with gastro-enterostomy is difficult, for it will vary so greatly with the preference of the individual surgeon for the one or other method, and the choice of case for which he performs the individual operation. Thus the surgeon who uses partial gastrectomy as a routine operation for all cases will have a much lower mortality than one who performs it relatively seldom, and only for extensive ulcers in poor subject (Table IV.). There is no doubt, however, that partial gastrectomy is an operation of considerable magnitude even when carried out as a routine measure, and thus performed in easy cases with small non-adherent ulcers. Thus Louria, in analysing the cases of von Haberer, who is a strong supporter of the routine use of partial gastrectomy, found that the total mortality was 8·4 per cent., although with the use of Billroth's first method it fell to 6 per cent., but that the mortality can be even further reduced by wide experience is shown by Finsterer's series of 407 cases with a mortality of 4·4 per cent., which was again reduced in the last three years to 1·8 per cent. In the hands of surgeons without this wide experience and skill the mortality is more likely to approximate to 15-20 per cent. Recurrence after operation is very rare. When performed for pyloric or duodenal ulcers it does not give a complete immunity to the later occurrence of gastro-jejunal ulcer, and in fact some surgeons have abandoned the use of Polya's operation for these conditions owing to its danger. When performed for ulcers of the body, this complication is practically non-existent, and true recurrence is almost unknown. In my own series of 246 cases there was no single example (Table IV.). The chief objection lies in the theoretical one of the removal of so large a portion of the normal stomach and the possibility of a later occurrence of a severe pernicious anæmia, the frequency of which is very difficult to estimate.

Local resection, on the other hand, appears to be a much less severe procedure. In my series of 244 ulcers of the body treated by this method there were nine deaths, a mortality of 3·6 per cent., while in 28 hour-glass stomachs there were two deaths, a total of 272 cases with 11 deaths (Table V.). There were, however, in this series two recurrences, one after excision of a simple ulcer and one after excision for an hour-glass stomach. The end-results are good with either method. In the series of cases watched for at least five years which I have previously published, local resection with gastro-enterostomy gave 88 per cent. known cures, a figure which rose to 92·1 per cent. if the untraced cases were omitted. My own view, therefore, is that wherever possible either a local resection with a gastro-enterostomy or a partial gastrectomy should be the operation of choice. In my own hands local resection has given the lower mortality and the highest percentage of late cures and is free from the objection that it removes a large portion of the normal stomach.

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TREATMENT OF TETANUS BY INTRATHECAL INJECTION OF *CARBOLIC ACID*.*

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THE recognised treatment of tetanus with daily intrathecal injections of 12,000–20,000 U.S.A. units of concentrated antitetanic serum is uncertain and often disappointing in its result. Bacelli's carbolic treatment (10 c.cm. of 1 per cent. solution subcutaneously every two hours) has not been successful in other hands. In 1923 I began treating a few cases of tetanus with intramuscular injections of 2 c.cm. of 5 per cent. carbolic acid twice a day. The result was far from satisfactory, but success in one mild case put the idea into my mind that carbolic acid could counteract the tetanus toxin, and if brought in close contact with it might overcome it altogether.

It is known that carbolic acid has the effect of destroying tetanus toxin in vitro. Kitasato injected toxin plus carbolic into guinea-pigs and they did not get tetanus, while the controls treated with toxin alone showed tetanic symptoms and died. There is no reason why carbolic should not be administered intrathecally, if a solution could be found that would not produce too intense a reaction or inflammation.

Fresh leucocytes were obtained by lumbar puncture from a case of tetanus which had been treated 24 hours previously with intrathecal serum (which always causes a mild aseptic meningitis). Equal amounts of the cerebro-spinal fluid and different strengths of carbolic solution in physiological saline (0·75 per cent.) were mixed and incubated at 37° C. for an hour, and then a drop was examined under the microscope. The 1 in 400 carbolic solution was found to be the strongest that did not affect the leucocytes—except that they appeared to be slightly clearer than before treatment. This solution has a specific gravity of 1006, equal to that of the cerebro-spinal fluid. It was prepared for injection by adding 400 c.cm. of physiological saline (0·75) to 1 c.cm. of liquefied carbolic acid. It was boiled before use.

Narration of Fourteen Cases.

CASE 1.—A boy of 14 was admitted at 8 P.M. on July 18th, 1924, with signs of tetanus of 24 hours' duration. He had had a nail-prick on the sole some 12 days before. General clonic spasms occurred every two or three minutes with acute pain. His teeth could open to only one fingers-breadth, his back was arched, and his legs rigid. Our serum was out of stock, and I was loth to try carbolic. However, I summoned up courage, and gave 20 c.cm. of 1 in 400 carbolic in normal saline through a lumbar puncture, after withdrawal of the same amount of cerebro-spinal fluid. The foot of the bed was raised 12 inches for two hours.

The next morning, to my surprise, the boy was walking about the ward when I went my round. The nurse reported that an hour after the injection he had had a fit and a pink rash had come out all over the body. On examination he appeared well, without rigidity anywhere, and he could open his mouth widely. The skin showed a pink but faded rash with fine scales. His pulse, temperature, and respiration were normal. Four days later he had anasarca and fever. Blood casts and albumin were found in the urine. He was therefore transferred to the medical side as a case of acute nephritis due to carbolic. He recovered in a few days.

The success in this case was so dramatic and complete that it should have been a stimulus for me to go on with the treatment, but I could not help being afraid of some unforeseen calamities, the possibilities being injury to the nerve roots and cells, aseptic meningitis which might leave adhesions in the theca, and late results, such as impairment of brain functions and weakness and paralysis due to impairment of the central nervous system. Above all these, acute nephritis might not end so happily as in the first case.

I therefore turned back to antitetanic serum, but now with larger doses intrathecally and in some cases intravenously as well. After five years of despair I gave up the serum treatment and stared ruefully at the 1 in 400 solution of carbolic once more. In the next case a smaller dose was tried and a second dose had to be given.

CASE 2.—A schoolboy of 19 had had a fall on the football field. On admission, on March 5th, 1929, it was found that he had a number of small ulcers on both knees; the jaws and back were stiff, and painful spasms occurred at hourly intervals; he also complained of headache. He was given 15 c.cm. of 1 in 400 carbolic in normal saline intrathecally, but did not appear any better. A second injection of 15 c.cm. was given the next day. Spasms then decreased and disappeared in 48 hours. Recovery was slow. The patient seemed dazed for four or five days after the second injection. The urine was found normal throughout the illness. The cerebro-spinal fluid withdrawn by the second lumbar puncture was turbid and contained numerous leucocytes.

(For nine months after this I had not a single case of tetanus, though my two colleagues had four or five cases between them.)

CASE 3.—A girl of 12 was admitted on Jan. 26th, 1930, with severe symptoms: clenched teeth, almost continuous spasms, and failing heart, within 24 hours of the onset. She was given 20 c.cm. of carbolic solution intrathecally under chloroform, but little hope for recovery was entertained, and she died 12 hours later.

Failure of the treatment in this case put much doubt in my mind as to its utility, and this accounts for the irregularity of treatment in the next case. I thought it was possible that the solution entered a vein in Case 1 and that the recovery might have been due to an intravenous instead of an intrathecal injection. As a result of my bewildered thought, 1 in 400 carbolic was tried intravenously in the next case.

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CASE 4.—A Hindu, 22 years of age, was admitted on March 21st, 1930, with four days' spasm after wounds on knee and elbow. On examination he could open his teeth one fingers-breadth, the recti were hard, and opisthotonos was present. Painful spasms occurred every five to ten minutes. I gave him 10 c.cm. of 1 in 400 carbolic in normal saline intravenously at 3 P.M., and the same amount again at 10 P.M. The next morning 15 c.cm. were again given intravenously. As he appeared worse, 9000 units of antitetanic serum were given intravenously. On the third and fourth days he seemed recovering, but he became worse on the fifth day, when the same amount of serum was again given intravenously. This was repeated on the sixth day. On the seventh day the patient appeared very ill, and 48 c.cm. of carbolic solution were given intrathecally; this was immediately followed by a rise of temperature and headache. On the eighth day the spasms disappeared, but tonic opisthotonos remained for four days afterwards. I believe the opisthotonos was produced by irritation of motor nerve roots by carbolic. He recovered fully and was discharged from hospital 15 days after admission.

CASE 5.—A girl of 15 was admitted on March 27th, 1930, with severe symptoms: clenched teeth, continuous spasms, and failing heart. The first clonic spasm had been felt 24 hours earlier. No hope of recovery was entertained, but 20 c.cm. of carbolic solution were administered intrathecally under chloroform. The patient died ten or 12 hours later.

CASE 6.—A patient of 17 was admitted on April 18th, 1930, with partial lockjaw and general spasm of five days' duration after a nail-prick on one palm which had healed. On examination, he could separate his teeth one and a half fingers-breadth; his back was rigid and he had clonic spasms at uncertain intervals. His pulse-rate was 80–90, and his temperature 38° C. He was able to pass urine naturally.

The officer on duty gave 4500 units of antitetanic serum subcutaneously and 3 c.cm. of 2 per cent. carbolic intramuscularly. On April 19th I saw the patient at 10 A.M., when clonic spasms were occurring every five to ten minutes and he could separate his teeth only one fingers-breadth. At 11 A.M. 40 c.cm. of 1 in 400 carbolic in normal saline were given intrathecally under chloroform, after withdrawal of the same amount of cerebro-spinal fluid under its own pressure. The foot of the bed was raised for two hours. The patient perspired freely, complained of heat, and was restless. The temperature rose to 38·5° C. and the pulse-rate to 100–104. He calmed down at the end of four or five hours and fell asleep. On April 20th he appeared better. He could open his mouth more, and clonic spasms were absent, though his back was slightly rigid. On the 22nd he was well. He walked about with a rigid back and neck with a certain amount of torticollis. On the 23rd the temperature was 39° C. and the pulse-rate 90–100. A scarlet rash appeared on the front of both thighs, the shins, the anterior surface of the forearms, and the lower abdomen. Examination of the urine showed granular and blood casts, red blood cells, and transitional epithelial cells—a picture of acute nephritis and pyelitis. He was put on carbohydrate diet, mainly of wet-boiled rice. On the 24th he appeared better though his back was still rigid. On the 27th the temperature, respiration, and pulse-rate came down to normal. The back was still rigid. On the 29th the urine was normal. On the 30th he was well and discharged from hospital.

He had been able to take food and pass urine and fæces naturally throughout the illness.

CASE 7.—A boy of 6 was admitted on June 2nd, 1930, for bladder stone, and operated upon on June 7th, when a stone was removed through a suprapubic incision. The notes were as follows:—

June 13th: Catheter removed from urethra. Urine contained pus and overflowed through suprapubic opening. 15th: Slight jerks of limbs noticed by father of patient in the evening but not told to the nurse on duty. 16th: Back arched, abdominal wall rigid. Distension and constipation present. Mouth opened fully. No contraction of facial muscles. Tetanus was diagnosed on the ground of the presence of tonic and clonic contractions of the back and legs. At 2.30 P.M., 8 c.cm. of 1 in 400 carbolic in normal saline were injected intrathecally under chloroform. At this moment the patient was observed to have jaundice and a pulse-rate of 112, but no rise of temperature. On June 17th the jaws were closed; the teeth opened two fingers-breadth at most. The spasms were worse. Twelve c.cm. of carbolic solution were administered intrathecally. On the 18th the patient was worse and 20 c.cm. of carbolic solution were given intrathecally. The spasms were less in frequency and severity. The legs were flaccid, the back was slightly rigid, and the teeth clenched; risus sardonicus was present but tonic in character, and the eyelids were closed tightly. The temperature was 39·5° C., and pulse-rate 120–130, and the respiration-rate 36–40. He was given 200 c.cm. of 5 per cent. glucose subcutaneously on account of acidosis. On the 20th he appeared better in the morning. Clonic spasms were slight and appeared at long intervals, but the teeth were always clenched. Coma supervened in the afternoon and death at 10 P.M. The morning urine showed pus cells but no blood or casts.

At autopsy on June 21st congestion of the brain was found but no visible change in the pons or medulla. The right kidney was congested, with scattered spots of pus. The left kidney was small and showed pyonephrosis. Microscopic sections of the medulla and pons showed no changes.

CASE 8.—A boy, 11 years of age, was admitted on July 8th, 1930, with lockjaw, stiffness in the back and abdomen, and painful spasms. He was able to open his mouth to one and a half fingers-breadth. The temperature was 36° C., the pulse-rate 74, and the respiration-rate 24. He had a wound on the shin 2 by 3 cm. due to broken wood (June 25th). The day before admission he felt stiff in the lower chest and came to the out-patient department. He was advised to stay in hospital but did not come again until the next afternoon. He was given 20 c.cm. of 1 in 400 carbolic in normal saline intrathecally under chloroform and the wound was scraped. The foot of the bed was raised for an hour and a half. Syrup of chloral, one drachm four times a day, was ordered. A few hours after the injection the temperature was 30° C., the pulse-rate 120, and the respiration-rate 30.

On July 9th, at 8.30 A.M. there were no spasms. The temperature was 38° C., the pulse-rate 120, and the respiration-rate 30. His back and legs were rigid, and he was thirsty and restless. His jaws were closed. The urine contained acetone but no albumin, sugar, or cells. At 4 P.M. the back and legs were less rigid and the jaws opened one fingers-breadth. There were no spasms and the patient felt well and said he had no more pain. On July 10th the back was arched. The jaws opened one fingers-dreadth. There were no spasms, and the limbs were relaxed. The eyelids were slightly contracted. The temperature was 36·7° C., the pulse-rate 100, and the respiration-rate 28.

The jaws and legs remained stiff and arched for many days, though the general condition showed that the patient had recovered. Stiffness disappeared slowly and not without anxiety. Electrical massage was given for 10 days, after which recovery was complete. The patient was allowed to run about but was kept in hospital for observation for three weeks. There is no doubt that the stiffness was due to irritation of motor nerve roots by the carbolic. Frequent examinations of the urine did not show any inflammation of the kidneys, and carbolic was not detected when the liquor ferri perchloridi test was employed.

CASE 9, a chauffeur of 25 was admitted on July 14th, 1930, having had a cut from a table-knife 10 days before. The wound had healed, but six days before had reopened when he was washing his car. On July 13th he had a very painful contraction of the arm. On the 14th I was called to see him at 9 P.M. He was having an attack of painful spasm in the limbs and trunk, which had begun an hour earlier. His right forearm was swollen, his wrist was flexed, and the flexor muscles of the forearm stood up hard. There was a small suppurating wound on the outer side of the wrist. The jaws were not stiff. He was shaking with violent pain. I administered an injection of morphia at once, which gave immediate relief. The general spasm disappeared but the right forearm remained contracted and painful. There was some stiffness in the left arm. The patient was taken to hospital, and at 10 P.M. 30 c.cm. of 1 in 400 carbolic were given intrathecally through a lumbar puncture without chloroform, for he could bend his back. The extrathecal portion of the path of the trocar was preliminarily anæsthetised with 1 c.cm. of 0·5 per cent. novocain.

On July 15th the patient complained of a slight headache during the night but slept fairly well. The erector spinæ stood up slightly but no stiffness was complained of. At 4 P.M. he had another painful attack of generalised spasm for an hour, which passed off after a drachm of syrup of chloral. It was lucky for the patient that I was out, otherwise I might have given him a second dose of carbolic, which would have been unnecessary and perhaps harmful. On July 16th the patient felt well and had slept well. The wrist was still flexed but without pain. Silver colloid was injected intramuscularly on account of the cellulitis of the forearm. On the 17th he felt well. The wrist was no longer flexed. The forearm was still swollen but the inflammation had receded. The wound had nearly healed. On the 18th he was discharged with a swollen but painless forearm. He reported himself well a few days later.

CASE 10.—On Sept. 13th, 1930, a patient of 20 slipped when jumping off a tramcar and his right foot was crushed by one of the wheels. He was taken to the Central Hospital, where saline and 1500 units of antitetanic serum were given subcutaneously. Amputation of the foot was advised, but the patient refused. On Sept. 17th he was admitted into the King Chulalongkorn Memorial Hospital with a foul wound and a gangrenous limb. He had been treated at home with a poultice of Chinese herbs, which generally contains many kinds of pathogenic micro-organisms. On Sept. 18th Syme's amputation was performed under stovaine. On Sept. 21st I was asked to see the patient, who had developed lockjaw. The sister of the ward had noticed the morning before that he had some difficulty in opening his mouth. When I saw him (9 A.M.) his jaws were stiff and would open only a little. The muscles of the abdomen, chest, back, and neck were contracted tonically, but there were no clonic spasms, nor had there been any. The patient said that he had no pain but felt stiff all over. His pulse was regular and strong, with a rate of 100 per minute, but on auscultation of the heart the first sound at the apex was strong, and the second sound hardly audible. Breathing was short and laboured. The wound was gangrenous, with acute cellulitis spreading to below the knee. The temperature was 37·2° C.

I here made a mistake in thinking that it was an early case, as he had no clonic spasms. It was probable that the manifestation of the disease was modified by the previous injection of serum. I put him under chloroform and made a lumbar puncture, keeping in mind the possibility of acute meningitis after an intrathecal injection (in this case, of stovaine). The cerebro-spinal fluid, however, was clear, and I injected 35 c.cm. of 1 in 400 carbolic in normal saline into the theca. At 8·30 P.M. the neck and back were less rigid, the teeth were clenched, clonic spasms were absent, the respiration was short and laboured, and the heart was failing with the second sound inaudible. He died at 4·30 A.M.

CASE 11.—A man, aged 57, was admitted on Oct. 10th, 1930, for painful spasms of the back. He had had a prick from a splinter on his finger on Sept. 20th, followed by suppuration of the whole finger, leaving a sinus. Local spasm of the finger and rigidity of the back had been present for four days. Clonic painful spasms of the back began about 5 or 6 P.M. on Oct. 9th.

On examination on Oct. 11th the back muscles were rigid, and the jaws stiff, opening to two fingers-breadth at the most. At 2.30 P.M. he was given 40 c.cm. of 1 in 400 carbolic intrathecally under chloroform, after withdrawal of 15 c.cm. of cerebro-spinal fluid. He slept for two hours afterwards. At 8 P.M. he had a severe rigor, and his temperature was 41° C., his pulse-rate 124, and his respiration-rate 30. He had headache, but his back was no longer stiff, and the jaws could open widely. On Oct. 12th he had occasional spasms from 2 A.M. to 9.30 A.M. The temperature had come down almost to normal. He could open his mouth widely and move his lower jaw freely. On Oct. 13th he was free from spasms, but somewhat drowsy, and was startled when touched. His temperature was 38° C., and his pulse-rate and respiration good. On the 14th they were all normal, and there were no spasms. The back was slightly rigid and the patient complained of stiffness all over this body. The jaws opened and moved with ease.

On Oct. 20th round scarlet macules, 1 mm. in diameter, appeared on the exposed parts of the body. On the 24th the back was no longer rigid. On the 26th the feet were œdematous. On the 28th the rash had disappeared, but there was œdema of both legs. On Nov. 4th there was œdema of both legs and ascites, and frequent painful micturition. On the 5th the patient left hospital, in spite of persuasion to remain.

Examination of the urine at frequent intervals from the day of admission showed chronic infection of the bladder. On rectal examination the prostate was not found enlarged. A stricture of the urethra was present, admitting only a small-sized catheter and that with pain. No definite impairment of the heart was detected.

CASE 12.—A married woman, aged 26, admitted for painful contraction of both arms and hands on Oct. 13th, 1930, was found to have a suppurating wound above the right heel which she had received the day before. The right calf muscle was contracted but without pain. Both arms were flexed at the elbows and wrists. The hands were closed tightly. The spasms of the upper extremities were continuous and most painful, but somewhat relieved by 0·015 g. of morphine given at once subcutaneously. Forty-five minutes after admission 35 c.cm. of 1 in 400 carbolic was given intrathecally. The temperature rose to 40° C. within four hours and then gradually declined to normal the next morning. Headache and vomiting followed the injection and passed off on the third day. The spasm of the upper extremities and the rigidity of the calf muscle disappeared a few hours after the administration of carbolic.

On Oct. 20th pink, discrete, round macules, 1–2 mm. in diameter, slightly itchy, appeared on the trunk and thighs. The patient again vomited. The temperature was 37·2° C., the pulse and respiration normal. Headache was present. Ophthalmic examination revealed no papillœdema. The rash reached its height on the third day, when the whole body, including the face, was covered with a scarlatiniform rash. On the seventh day it faded, leaving a general discoloration of the skin with slight scales on the face. The general condition of the patient was good, though she complained of a feverish and nauseated feeling and vomited occasionally. On the ninth day the whole body was covered with scales and flat vesicles. These were dressed with baby talcum. On the eleventh day all the vesicles had burst, leaving dry scales which were easily washed off. The face had suffered as much as the body. The patient was discharged well on Nov. 10th. The urine was normal throughout the illness.

CASE 13 (*Tetanus neonatorum*).—A male baby, 8 days old, was admitted on Nov. 17th, 1930, because the mother found the day before admission that it sucked with difficulty, bit the nipple, and seemed stiff in its jaws. The temperature was 38° C. The jaws opened slightly, and the back was stiff and the abdominal wall rigid and protuberant with distension of the bowels. Frequent motions containing mucus, blood, and living *Amœba hystolytica* were passed. The umbilicus was septic. He was given 1/12th of a grain of emetine intramuscularly. On Nov. 18th he passed two motions, both hard and small in volume. The jaws opened slightly, but he would not suck, and feeding was suspended for 24 hours. The back was arched and the legs and abdominal wall were rigid. General clonic spasm was present at intervals, but the baby slept between spasms. At 4 P.M. he was given carbolic 1 in 400, 3 c.cm. intrathecally under chloroform. (Some difficulty was encountered in performing the lumbar puncture.) At 12 P.M. the temperature was 40° C. with profuse perspiration. On Nov. 19th at 8 A.M. the temperature was 37·2° C., and there was dyspnœa. The baby would not suck, but was able to swallow when fed artificially. At 12 P.M. the temperature was 40° C., and at 4 P.M. it was 38°. Clonic spasms occurred at intervals, but were less in severity. He slept between spasms and his jaws opened more widely. The motions were good. The back was rigid and the legs stiff.

Scarlet macules, 1 mm. in diameter, appeared on the back of the hands and lower half of the forearms, where the skin appeared paler than elsewhere. The lips were dry, and the tongue clean. On Nov. 21st he appeared thin, but the skin was not shrunken, and there were no spasms. The back and legs were slightly rigid. He sucked his mother's breasts. The rash faded, and on the 23rd had disappeared. There were no spasms or rigidity of the back or legs, but he was constipated. He was discharged from hospital.

CASE 14.—A married woman, aged 60, was admitted on Dec. 3rd, 1930, with lockjaw and stiff back after a nail prick on the left sole 20 days before. The wound had healed. The back muscles were contracted so that a hand passed easily between the patient's loin and the bed. The left erector spinæ was more rigid than the right. Her mouth could open, but with difficulty. Risus sardonicus was present. She could not take solid food, and swallowed liquids with some pain in the back of the throat. There were slight spasm at long intervals. One drachm of syrup of chloral thrice daily was ordered. The patient seemed better in the afternoon and was able to swallow food. 10 c.cm. of antitetanic serum was given subcutaneously (to conform to the patient's wish and allay her anxiety). On Dec. 4th she was able to swallow. Spasms were more frequent—twice in an hour and on handling—and the back was stiff, and the jaws stiffer than before. She was given 30 c.cm. of 1 in 400 carbolic solution intrathecally under chloroform at 10.10 A.M. after withdrawal of 30 c.cm. of fluid. At 3.45 P.M. she was restless and hot; her head ached, and her temperature was 38·5° C. She was given one Veramon tablet (grs. 7) every three hours until the headache was relieved. On Dec. 5th the morning temperature was 37·7° C. and the pulse-rate 100. She was sleepy but her headache had gone. The back was stiff, the mouth opened widely, risus sardonicus was present, and she was startled when touched. At 9.30 P.M. clonic spasms had disappeared, and pulse and temperature were normal. On the 9th she slept well. The tongue was red and raw. On the 10th the temperature, pulse, and respiration were normal, and the patient felt well. The loin touched the bed but was still stiff. The calves and backs of the thighs were slightly stiff. The ankles were ventriflexed and the toes flexed. On the 13th she was well, and able to sit up. The left soleus muscle was slightly rigid. On the 14th she was discharged from hospital.

Urine examination was made daily and found normal.

I visited the patient at her home two weeks later and found her well and happy and able to walk upstairs unaided, though the calf muscles and erectores spinæ were still slightly stiff.

Summary.

Dosage.—30-40 c.cm. in adults; 12-20 c.cm. in children of about 12, adjusted according to the severity of individual cases. The doses in this series of 14 cases were too high, except in Case 2.

SEQUELÆ.

1. Rigidity of the back muscles is often present, due to irritation of the motor nerve roots, from the first to the seventh day of the injection. The decrease or disappearance of lockjaw is an indication of amelioration, though it is possible that carbolic may cause lockjaw through irritation of the fifth cranial nerve, when the seventh nerve will be simultaneously stimulated, as shown in Case 8 by slight tonic contraction of the facial and orbicularis oculi muscles—a tonic risus sardonicus.

2. A rash, varying in character and intensity, appears between the first and the seventh days and lasts from 4 to 14 days. It abates without treatment and should cause no anxiety. It may be due to overdose, but is probably produced by the elimination of carbolic by way of the skin.

3. Acute nephritis was present in Cases 1, 6, and 11, no doubt due to elimination of carbolic through the kidneys. This treatment should therefore not be given to patients with chronic renal disease, especially old people who have some impairment of the kidneys. However, Case 14, 60 years of age, got well without this complication.

There were no late complications of the nervous system. The older cases, 2, 5, 8, 9, were traced to their homes in November, 1930. The school-boy (Case 2) had passed his intermediate school examination. The Hindu (Case 5) was busy collecting grass for his cows and going his morning rounds in his cart with milk-bottles. The boy of 11 years in Case 8 had become an errand-boy. The chauffeur (Case 9) was driving his master prince to and from the barracks every day.

The advantages of carbolic over serum are: (1) it is more certain in action; (2) one injection suffices; (3) the cost is almost nil.

The only disadvantage is the danger in chronic kidney disease.

Conclusion.

Though the number of cases treated is as yet small, I venture to form an opinion that carbolic acid given intrathecally is a specific remedy against tetanus. Out of 14 cases treated four died, but these were severe cases, having reached the final stage of cardiac and respiratory failure, except Case 7 which, I think, died from uræmia due to the already infected kidneys rather than from tetanus. There seems to be little doubt that the ten patients that recovered owed their lives to the carbolic treatment, for they were not of the mild variety that might recover spontaneously. Any amount of serum which had been given inadvertently was not sufficient to effect a cure. Besides, in no case had it been given intrathecally. The intrathecal carbolic treatment has been given without selection to all cases of tetanus admitted into the King Chulalongkorn Memorial Hospital, since Jan. 26th, 1930 (Case 3), up to the present time (end of 1930), with the exception of two moribund cases of tetanus neonatorum. The recovery in Case 13 (tetanus neonatorum) was remarkable.

TREATMENT OF INTESTINAL OBSTRUCTION.

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It has been suggested that operation for the relief of small-bowel obstruction should be delayed until dehydration has been overcome, but it is necessary to review very carefully all the information available before making such a serious change. It is generally recognised that the number of hours elapsing between the onset of symptoms and the relief of small-bowel obstruction is directly proportional to the mortality percentage. Thus there will be a mortality-rate of about 30 per cent. among patients who have had symptoms of obstruction for 30 hours. While this is a rough and somewhat inaccurate basis for prognosis, a review of published mortality statistics shows that it is sufficiently correct for practical purposes. If each hour's delay increases the risk of death by 1 per cent. it is evident that operation must not be delayed on any account unless the new therapeutic procedure can guarantee a lowered mortality in spite of the delay.

As a result of the exhaustive study of small-bowel obstruction which has been carried on, mostly in America, during the past 15 years, it is now clearly recognised that such obstructions fall into two great groups: (1) simple obstruction without impairment of the blood-supply, and (2) strangulated obstruction with impairment of the blood-supply.

Most studies of small-bowel obstruction have been concerned only with the former group, and death has been definitely shown to be due in these cases to dehydration. In the strangulated type the vitality of the bowel wall is rapidly impaired, gangrene results, and death occurs through toxæmia or through perforation and peritonitis—as a rule, before there are very marked changes in the levels of the blood-chlorides, carbon dioxide combining power and total non-protein nitrogen, and before dehydration can assume a fatal proportion.

Dehydration in Simple Obstruction.

In simple obstruction, as carried out experimentally, a different picture is seen. Here the few circulatory changes in the bowel wall do not lead to the rapid onset of gangrene. Toxæmia due to these factors plays a much less important rôle. The persistent loss of gastro-intestinal secretion so deprives the body of its normal ionic content, chiefly derived from sodium chloride, that water cannot be retained in the body and death ensues owing to dehydration.

Normally, several thousand cubic centimetres of gastro-intestinal secretions, rich in sodium and chloride, are poured into the stomach and upper part of the small bowel every 24 hours. These fluids play their part in the digestion of food materials and are reabsorbed in the lower part of the bowel. As fluid in the stomach and bowel is outside the body proper it is lost to the body until it is reabsorbed. By the constant secretion and reabsorption of this great volume of fluid and salt, the normal fluid metabolism of the body is maintained. The amount of water imbibed only replaces that lost through perspiration, respiration, and excretions.

When the small bowel is obstructed this endless chain of secretion and reabsorption is broken. The secretion continues to be poured out, but it cannot pass beyond the obstruction to be reabsorbed. The bowel responds to the blockage with hyperperistalsis. The fluid is forced against the obstruction and a reverse current is formed, which carries the fluid backwards and finally into the stomach, which fills up and eventually overflows. This causes the regurgitant type of vomiting so usual in the later stages of obstruction, consisting of foul-smelling greenish or yellowish material. As these secretions collect and stagnate, aerobic and anaerobic bacteria rapidly grow, fermentation occurs, and so gas collects, increasing the distension. It is this distension by gas and fluid which makes X ray diagnosis so valuable in these cases. If a patient suspected of having intestinal obstruction is X rayed in the erect position or lying on the side, and the plate shows a distended small bowel with fluid levels, a diagnosis of intestinal obstruction can be made. The first vomiting which occurs in intestinal obstruction is reflex and empties the stomach. After this the vomitus consists of gastro-intestinal secretions rich in sodium chloride. As reabsorption of this sodium chloride is prevented, the sum total of this salt in the body progressively diminishes. Any reserve stores which may exist in the skin are soon exhausted.

It is generally accepted that the total fluid in the body is maintained by its total ionic content which, in the case of blood-plasma and interstitial fluid, consists practically wholly of ionised sodium chloride. With the loss of sodium chloride by vomiting the ability of the body to maintain its fluid is likewise lost and dehydration rapidly ensues. It is often supposed that the progressive fall of plasma chloride, so typical of intestinal obstruction, is the result of this dehydration and shows the degree of dehydration present. This is not strictly accurate. The chloride is lost, as hydrochloric acid, in the stomach secretion. This chloride radical is replaced by CO_2 radical in the blood-plasma. There is consequently a marked increase in the carbon dioxide combining power in the plasma, giving a severe alkalosis. The total ionic content of the plasma, however, is not necessarily changed. It is thus evident that both acid and base radicals must be lost from the blood-plasma before the total ionic content falls, and it is unable to retain its normal amount of fluid.

Gamble and Ross[1] suggested that dehydration is due to the loss of sodium. Sodium determinations on the blood-plasma show a slight but progressive diminution in these cases. The percentage of sodium falls, however, because the total ionic content has been increased in other directions. The total non-protein nitrogen and urea nitrogen increase greatly, and this increase may be, to some extent, ionised, thus increasing the total ionic content. If no free hydrochloric acid were lost in the stomach secretion and waste products did not accumulate in the blood, it would be quite possible to have a very marked degree of dehydration with no change in sodium and chloride blood-plasma percentage determinations. If, however, the total sodium chloride in the plasma of the body could be estimated, a very marked decrease would be shown. As I have demonstrated elsewhere,[2] the total ionic content of intracellular fluid is made up largely of potassium and phosphoric ions, which are not lost in the gastro-intestinal secretion, and thus the intracellular fluid is not disturbed in dehydration to any great degree. Dehydration affects mainly the blood-plasma and the interstitial fluid. That this dehydration is the cause of death in simple small-bowel obstruction has been definitely shown by many investigators—Hartwell and Hognet,[3] Haden and Orr,[4] Gamble and McIver,[5] Armour, Mitchell, and Stewart.[6] Animals with complete duodenal obstruction can be kept alive for six weeks or more provided that *the lost sodium chloride can be restored and starvation prevented.*

Simultaneous Treatment of Dehydration and Obstruction.

As death in simple obstruction is thus definitely caused by dehydration, it is easy to see how the suggestion has arisen that, before the patient is exposed to a serious operation, steps should be taken to overcome dehydration by the intravenous injection of sodium chloride solution. This suggestion ought to be worded differently. By all means give sodium chloride solution, either isotonic or hypertonic, but this procedure should not delay the operation by one minute. It has been shown that dehydration is the cause of death only in simple obstruction. This work has only been carried out experimentally on dogs. The great majority of cases of small-bowel obstruction found at operation are of the strangulated variety. This applies to all those cases caused by herniæ, volvulus, twisted Meckel's diverticulæ, and, as a rule, those arising from adhesions. Furthermore, except in cases where strangulated herniæ can be recognised, it is quite impossible to differentiate between the simple and the strangulated varieties before operation. It is therefore imperative to treat for the more serious possibility—namely, strangulated obstruction. Death in those cases occurs early, before any great degree of dehydration has occurred, and is due to toxæmia. Only early operation will save them.

When discussing the clinical application of experimental findings, consideration must also be given to the important question of whether the results of simple obstruction in dogs are exactly similar, in all the physiological and pathological effects, to those in man. I have found less distension and less marked changes in the bowel walls after obstruction in dogs than is usually present at operation on clinical cases. At operation the human bowel is often greatly distended, very dark purple in colour from prolonged congestion, and very thin. It has been shown that great distension impairs the circulation in the bowel wall by obstructing the venous return. If this be so, it follows that even in simple obstruction in man the factor of toxæmia due to impaired blood-supply of the bowel wall cannot altogether be eliminated. Personally, I do not believe that human beings could be kept alive for a month solely by means of the intravenous injection of salt solution, though dogs can.

A danger which must be recognised in the operative release of a mechanical obstruction is that, with the relief of distension, the venous return is permitted. After several hours of venous stasis there must be a great collection of histamine-like end-products from metabolism and from damaged bowel which are suddenly returned into the circulation. This event must accentuate any symptoms of shock which are already present. I believe this to be the cause of death in those cases of late obstruction which die a few hours after operative interference, although the operation has been relatively simple.

It seems, therefore, self-evident that to delay operation until dehydration can be overcome by means of intravenous saline therapy, checked by observation of the blood chemistry values, would be very unwise. It could only be of use in a very small percentage of cases of simple small-bowel obstruction, and these cases cannot be differentiated from the strangulated variety before operation. The rule of immediate laparotomy for intestinal obstruction must be adhered to, and it must be constantly borne in mind that the mortality in these cases is directly proportional to the number of hours occurring between onset of symptoms and relief of obstruction. In cases where the diagnosis is in doubt, the surgeon should never spend time in "masterly inactivity" or in observation of the further progress. A simple antero-posterior X ray plate will confirm the diagnosis in ten minutes. The patient should proceed directly from the X ray room to the operating room, where 1000 c.cm. of normal sodium chloride solution can be injected intravenously after the anæsthetic has started, while the patient is being prepared for the operation. The injection can, of course, be continued during the operation. If desired, 15 g. of sodium chloride may be added to the normal saline solution to hasten the return of blood chlorides to normal. Such a procedure will reduce the unfortunately large and, I believe, unnecessary mortality which occurs in so many hospitals from small-bowel intestinal obstruction.

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CLINICAL AND LABORATORY NOTES

BLOOD-PLATELETS IN PERNICIOUS ANÆMIA.

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Observations upon the blood-platelets in pernicious anæmia are scanty and to some extent contradictory. As the result of the study of the blood in cases under treatment with liver one of us (S. C. D.) gained the impression that these elements of the blood were scanty during the relapse phase but tended to increase in numbers with improvement of the blood picture. This impression was placed upon record[1] together with the statement that the platelets may in cases of pernicious anæmia be so low as 150,000 per c.mm. This statement was not based upon careful and systematic observation, which since then has shown that during the relapse phase the platelets occur in far fewer numbers than then stated, and, furthermore, that they actually do increase to normal under liver therapy.

Case Histories.

Case 1.—Female, aged 36. Admitted Oct. 15th, 1930, with history of weakness and lassitude extending over two years; more recently tingling, numbness, and loss of power in legs, anorexia, and loss of weight. Occasional attacks of diarrhœa. On admission a pale, asthenic, and rather wasted subject, mentally very depressed; tendon reflexes present and normal in legs and arms, plantar reflex flexor; considerable disturbance of sensation in legs and to a less extent in arms; almost complete loss of power in right leg and movement of left leg very much impaired.

A fractional test-meal taken shortly after admission showed complete absence of free hydrochloric acid; this examination was repeated two weeks after the commencement of treatment having been immediately preceded by the injection of half a milligramme of histamine; free HCl remained absent. The blood-picture at the commencement of treatment was: hæmoglobin (Hb.), 38 per cent; red cells, 1,510,000 per c.mm.; white cells, 3400; colour-index, 1·26; volume-index, 1·5. The percentages of white cells were: polymorphs, 57; lymphocytes, 41; monocytes, 2. No eosinophils or basophils were seen. There was some anisocytosis and poikilocytosis of red cells, with many nucleated red cells. The mean diameter of red cells (halo method) was 8·3μ. The van den Bergh reaction was direct negative; indirect positive, and the bilirubin 14 mg. per litre.

Treatment was carried out with a commercial liver extract and whole liver on alternate days; in addition dilute HCl to the extent of 20 minims four times daily was given, before meals. The first observation on the platelets was made on Oct. 28th, five days from the commencement of liver treatment. They were found to number 91,000 per c.mm. The blood at this time showed the height of the reticulocyte crisis, the reticulocytes forming 11·6 per cent. of the red cells, a total of 211,120 per c.mm. Four days later the platelets had risen to 293,000 per c.mm. Thereafter their numbers fluctuated considerably but never again fell so low as on the first examination. The behaviour of platelets, red cells, and reticulocytes was as follows:—

	Red cells (in thousands).	Reticulocytes. Total and per cent.	Platelets.
Oct. 28th	1,820	211,120 (5·0)	91,000
„ 31st	1,820	—	293,720
Nov. 4th	2,010	274,230 (4·6)	118,590
„ 11th	2,970	None seen.	187,110
„ 18th	3,490	„ „	320,000

Case 2.—Female, aged 55. History of anorexia and constipation with pain in lumbar region for past seven years. Loss of weight last two years, vomiting last two weeks. Admitted to surgical ward as case of cholecystitis. Jaundiced, anæmic. The blood-picture on March 13th was Hb., 38 per cent.; red cells, 1,370,000 per c.mm.; white cells, 10,000 per c.mm.; and colour-index, 1·42. The percentages of white cells were polymorphs, 39; lymphocytes, 55; and monocytes, 6; no eosinophils or basophils were seen. There was considerable anisocytosis of red cells and the mean diameter of red cells was 8·5μ.

Fractional test-meal showed complete absence of free HCl from all specimens. The progress of the case was as follows:—

	Red cells (in thousands).	Reticulocytes. Total and per cent.	Platelets.
March 13th	1,370	41,000 (3·0)	124,600
„ 20th	1,920	48,000 (2·5)	132,400
„ 25th	2,410	16,000 (0·7)	175,930
	Discharged from hospital.		
Sept. 15th	4,250	Absent.	243,256

Case 3.—Female, aged 63. History of weakness and shortness of breath for three months; numbness and weakness of legs for past month. On admission skin lemon-yellow in colour; spleen palpable, no tendon reflexes obtained in any limb. Plantar reflex flexor.

The blood-picture on Feb. 4th, 1930, at the commencement of treatment was: Hb., 34 per cent; red cells, 1,260,000 per c.mm.; white cells, 2100; colour-index, 1·35; reticulocytes, 1·3 per cent. of red cells; and platelets, 22,800 per c.mm. The percentages of white cells were: polymorphs, 47; lymphocytes, 45; monocytes, 5; and eosinophils, 3. No basophils were seen. There was marked anisocytosis and poikilocytosis of red cells and the van den Bergh reaction was negative direct, indirect positive, and the bilirubin 45 mg. per litre. A fractional test-meal showed complete absence of free HCl.

The patient was treated for two weeks on a German preparation of dried stomach upon which she made no progress whatever. At the end of this time the red cells remained at their original level, there had been no increase in the reticulocytes, and the platelets had fallen to 43,000 per c.mm. On Feb. 19th the patient was put on Ventriculin (Parke Davis), 10 teaspoonfuls daily. The subsequent behaviour of the red cells, reticulocytes, and platelets was as follows:—

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[1] Liver in the Treatment of Pernicious and other Anæmias, London, 1930.

	Red cells (in thousands).	Reticulocytes. Total and per cent.	Platelets.
Feb. 20th	1,440	15,800 (1·1)	51,840
,, 25th	1,370	177,100 (13·0)	36,520
,, 28th	1,870	177,650 (9·5)	22,440
March 4th	2,120	—	129,320
,, 10th	2,270	47,670 (2·1)	115,770
,, 14th	2,630	21,000 (0·8)	99,940
,, 19th	2,720	2,720 (0·1)	97,920
,, 25th	2,770	None seen.	121,880
,, 28th	3,040	,, ,,	100,320
May 13th	3,740	,, ,,	119,680
,, 27th	3,940	,, ,,	102,440

CASE 4.—Male, aged 67. History of weakness, breathlessness, and increasing pallor for three months; nausea but no vomiting, tingling, and numbness of fingers. On admission on Sept. 9th, 1930, he was strange in manner; the liver was palpable two fingers' breadths below the costal margin, the spleen just palpable. The blood-picture was: Hb., 14 per cent.; red cells, 660,000 per c.mm.; white cells, 3700; colour-index, 1·08; and volume-index, 1·06. The percentages of white cells were: polymorphs, 67; lymphocytes, 32; and monocytes, 1. No eosinophils or basophils were seen. There was slight anisocytosis of red cells. The mean diameter of red cells was 9 μ (approx.). The van den Bergh reaction was delayed positive direct and the bilirubin 45 mg. per litre.

Treatment was initiated with 2 oz. of a commercial liver preparation daily, together with dilute HCl by mouth. The behaviour of the red cells, reticulocytes, and platelets was as follows:—

	Red cells (in thousands).	Reticulocytes. Total and per cent.	Platelets.
Sept. 11th	660	1,320 (0·2)	29,040
Transfusion 12 oz. citrated blood.			
,, 15th	1,010	34,340 (3·4)	40,400
,, 19th	1,000	76,000 (7·6)	38,000
,, 23rd	1,450	—	114,550
,, 26th	1,810	128,600 (6·0)	135,750
,, 30th	1,960	52,020 (2·7)	119,560
Oct. 3rd	1,770	None seen.	198,240
,, 7th	2,600	,, ,,	261,800
,, 15th	3,090	,, ,,	174,610

CASE 5.—Female, aged 61. Admitted July 10th, 1930. One year ago begun to feel ill and weak. In January, 1930, she had taken to her bed and had been there ever since. For some months past vomiting had been frequent; there had been epigastric pain made worse by taking food and the skin had been somewhat jaundiced. The condition had been diagnosed as carcinoma of the stomach. On admission the patient appeared pale and jaundiced; spleen not palpable, pain on pressure in epigastrium; tongue smooth and glossy. There were no very definite signs of disturbance of the central nervous system; some œdema of the feet. Treatment was commenced by commercial liver extract two ounces daily together with HCl. The blood-picture at commencement of treatment was: Hb., 30; red cells, 870,000 per c.mm.; white cells, 4400; and colour-index, 1·73. The percentages of white cells were: polymorphs, 42; lymphocytes, 46; monocytes, 7; eosinophils, 3; and basophils, 2. There was slight poikilocytosis and anisocytosis of red cells. The mean diameter of red cells was 9 μ (approx.) The van den Bergh reaction was negative direct, positive indirect, and the bilirubin 34 mg. per litre.

	Red cells (in thousands).	Reticulocytes. Total and per cent.	Platelets.
July 11th	870	60,900 (7·0)	17,400
Transfusion 12 oz. citrated blood.			
,, 14th	1,150	112,700 (9·8)	34,500
,, 17th	1,540	236,400 (16·0)	67,700
,, 23rd	2,300	151,800 (6·6)	533,600
,, 29th	2,800	25,300 (0·9)	293,600
Aug. 5th	2,890	5,780 (0·2)	225,190
,, 12th	3,520	None seen.	207,680
,, 19th	3,740	,, ,,	250,580
Sept. 29th	5,860	Not examined.	Not examined.

On two occasions between July 19th and 22nd the patient complained of severe epigastric pain, coming on suddenly and lasting for several hours. The second attack was of considerable severity; the onset was sudden and the patient became very collapsed and short of breath; the pulse became feeble and irregular and for some hours the condition gave rise to considerable anxiety. There was no rise of temperature.

At the time the nature of the attacks was not diagnosed; the dyspnœa and collapse were consistent with a lesser degree of pulmonary embolism, and in view of the very high platelet count found on July 23rd, two days after the second attack, it seems in the highest degree probable that both these attacks were due to embolism following upon intravascular clotting due to the thrombocytosis. Several cases both of thrombosis and of pulmonary embolism following upon liver treatment in pernicious anæmia have been placed upon record, and one of us (S. C. D.) has elsewhere hazarded the suggestion that these accidents may be due to an increase in the circulating platelets. Howel Evans[2] has shown that an increase of the platelets above the numbers usually met with may be the precipitating cause of thrombosis and consequently of embolism; the present case would seem to indicate that for this reason such thrombotic accidents may occur in the course of the liver treatment of pernicious anæmia; probably they would best be prevented by not confining the patients too strictly to bed.

CASE 6.—Male, aged 57. Health good until two years ago when he accidentally fractured two ribs on left side. Since that time pain in left side and increasing weakness, for past month tingling and numbness of fingers and toes. On admission pale, not wasted, spleen not palpable, no abnormal physical signs. The blood-picture at commencement of treatment was: Hb., 37 per cent.; red cells, 1,540,000 per c.mm.; white cells, 8100; colour-index, 1·2; and volume-index, 1·6. There was no poikilocytosis or anisocytosis; nucleated red cells were present in fair numbers. The mean diameter of red cells was 8·5 μ (approx.). The van den Bergh reaction was direct negative; indirect very faintly positive. A fractional test-meal showed complete absence of free HCl. The Wassermann reaction was strongly positive.

	Red cells (in thousands).	Reticulocytes. Total and per cent.	Platelets.
Nov. 24th	1,540	13,800 (0·9)	224,840
Dec. 3rd	1,840	58,800 (3·2)	200,000
,, 16th	2,830	None seen.	445,000

No antisyphilitic treatment was adopted while the patient was under observation, it being particularly desired to ascertain whether or not a satisfactory response to liver could be brought about in the presence of a positive Wassermann reaction without such treatment. This proved to be the case.

Discussion.

The above observations serve to demonstrate that in pernicious anæmia in the stage of relapse the platelets are diminished to far below the normal number per c.mm. The lowest count recorded in the series was just over 17,000 per c.mm. in Case 5. It is noteworthy that in spite of this very considerable diminution there was neither in this nor in any other case any tendency towards hæmorrhagic manifestations. Taken into consideration along with the constant leucopenia in the relapse phase of pernicious anæmia these observations offer further proof of the fact which with growing knowledge of the condition becomes increasingly clear that the anæmia of pernicious anæmia is not due simply to destruction of red cells, but is an expression of a morbid state affecting the whole of the hæmatopoietic system.

It further demonstrates the fact that the effect of treatment by liver or desiccated stomach is not confined to the red cell-producing portion of the hæmatopoietic system, but is active on the whole of it. The exact manner in which this effect is brought about is unknown, but the result is to restore to normal the whole, not a part only of the system.

It is a noteworthy fact that the patient showing the lowest number of platelets at the commencement of treatment also showed the most rapid and striking rise. So great was the rise in this case that, as pointed out above, there is reason to believe that it led to a certain degree of intravascular clotting of the blood, with two attacks of pulmonary embolism, fortunately both very mild.

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[2] Evans, W. Howel: Jour. Path. and Bact., 1928, xxxi., 815.

SUMMARY.

1. In the relapse phase of pernicious anæmia the blood-platelets fall to a low level. 2. With improvement of the blood-picture due to treatment by liver or dried stomach the platelets rapidly rise in numbers. 3. This rise in the platelets may give rise to thrombotic accidents.

THE BLOOD-PLATELETS AFTER FRACTURE.

By J. Forbes Galloway, M.D. Liverp.,

FORMERLY HOLT FELLOW IN PATHOLOGY IN THE UNIVERSITY OF LIVERPOOL.

It has been pointed out by Howel Evans and his co-workers[1] that thrombosis and embolism follow parturition and surgical operations at a time which corresponds to the maximum of the rise in the number of blood-platelets that succeeds these conditions. Thrombosis and embolism tend especially to follow operations which involve the anterior abdominal wall, with resulting venous stasis due to diminution of muscular activity and of diaphragmatic respiration. An increase in the number of circulating blood-platelets and venous stasis seem therefore to be important factors in the onset of thrombosis.

FIG. 1.

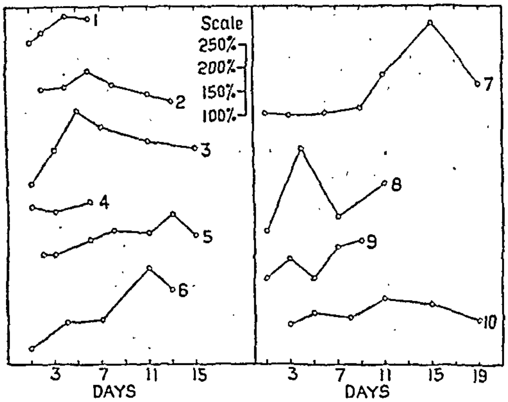


Chart showing variation in platelet counts following fracture in ten cases.

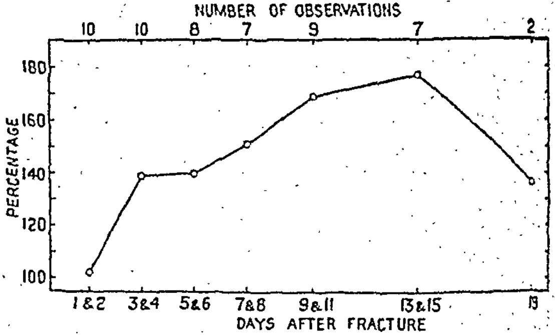
Fracture of the femur is a condition which has a high incidence of pulmonary embolism as a complication (Lister[2]). Its treatment differs from that of most other fractures in that it involves marked immobilisation of the patient, with resulting venous stasis. This suggests that another factor in post-operative thrombosis—an increase in the blood-platelets—may also occur after fracture.

Accordingly, the blood-platelets were studied in a group of ten cases of fracture, which were all simple but not in any other way selected. They consisted of :—

Case.	Age.	Fractured—
1 ..	14	Rib.
2 ..	67	Radius.
3 ..	26	Humerus, radius and ulna.
4 ..	40	Patella.
5 ..	23	Left transverse processes of 3rd and 4th lumbar vertebræ.
6 ..	77	Neck of femur.
7 ..	72	„ „
8 ..	42	Right temporal and occipital bones.
9 ..	35	Tibia and fibula.
10 ..	59	Right tibia and fibula, and left tibia.

It was obviously impossible to do platelet counts before the fractures occurred, so the first count done after fracture in each case was used as a basis for comparison and called 100 per cent., subsequent counts being expressed as a percentage of this figure. In seven cases the first count was done within 24 hours of fracture, in two cases within 48 hours, and in the remaining cases within 72 hours. The results of individual cases are shown in Fig. 1, and a composite result of all the cases has been constructed in Fig. 2.

FIG. 2.



Composite chart of the ten cases showing percentage increase of platelets following fracture.

From these figures it is seen that a definite increase in the blood-platelets occurs after fracture, reaching a maximum between the fourth and the fifteenth days.

This increase resembles so closely those which occur after parturition and surgical operations that it suggests a cause common to them all. These different conditions are all associated with damage to tissues and extravasation of blood, followed by its ultimate absorption, and in this absorption of damaged tissues lies a possible common cause.

JACKSONIAN EPILEPSY TREATED WITH TUBERCULIN.

By Walter Broadbent, M.D. Camb., F.R.C.P.,

SENIOR PHYSICIAN TO THE ROYAL SUSSEX COUNTY HOSPITAL, BRIGHTON.

In October, 1928, I was asked by Dr. W. G. Orchard to see a girl of 13, who was having right-sided fits, affecting the face and hand, several times a day, followed by a short period of unconsciousness, and affection of speech for half an hour after. She had complained of headaches since July, the fits had begun early in September, at first with a week's interval, but becoming rapidly more frequent. She was a pale, delicate-looking child. There was no apparent weakness of the right arm. Reflexes were exaggerated. The left optic disc was pinker than normal, and the vein large. The right disc was paler, but the vein looked large also. There were no abnormal physical signs in the chest or abdomen.

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[1] Dawbarn, R. Y., Earlam, F., and Evans, W. Howel: Jour. Path. and Bact., 1928, xxxi., 833.

[2] Lister, W. A.: THE LANCET, 1927, i., 111.

Pirquet's cutaneous test was found to be positive. I concluded that the epilepsy was probably due to a tuberculous tumour in the cortex, and recommended a weekly injection of tuberculin B.E., beginning with 1/100,000 very slowly increased; also a resting life in the open air as much as possible, and cod-liver oil and malt and a two-minim capsule of creosote three times a day. In January, 1929, the fits were much less severe and less frequent. In April, 1929, the attacks were shorter, and were not followed by aphasia, and they only occurred about once a week. Headache had gone. The child had grown four inches and looked very well. The tuberculin injections were continued. A guaiacol carbonate and potassium iodide mixture was given instead of the creosote, which was causing some indigestion.

I have just seen her again. She is a well-grown, healthy looking girl, and there have been no fits for many months. The only sign left is that, if she gets overtired, she may have a twitching of the right face and tongue. In the past I have successfully treated with tuberculin two other cases of Jacksonian epilepsy, in which the Pirquet reaction was positive, but they were not so severe as this one.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE.

SECTION OF SURGERY.

At a meeting of this section held on May 6th, Mr. C. H. **Fagge** being in the chair, a discussion on the surgical treatment of

Simple Ulcers of the Body of the Stomach

was opened by Mr. A. J. **Walton**. Of late, said Mr. Walton, there had been a revival in the medical treatment of chronic gastric ulcer, advocated by Dr. F. J. Smith in 1902, and of the claim that all uncomplicated ulcers were capable of being cured by alkalis. It was no doubt true that the majority of these cases lost their symptoms, but the apparent improvement was often no more than the usual period of remission. This treatment had been gradually abandoned owing to the high mortality from hæmorrhage and perforation. The pendulum however had swung too far, operation being performed for ulcers still capable of cure by simpler methods. It should however be remembered that the late end-results of a large series of cases treated medically had never been published, whereas the percentage of cures in operated cases was fairly accurately known. Briefly, the indications for operative treatment were: (1) severe radiating pain as indicating a deep penetrating ulcer; (2) failure of medical treatment to relieve symptoms; (3) history so long as to suggest a fibrous and callous ulcer; (4) recurrence of symptoms after an adequate course of medical treatment; (5) patient's inability to follow suggested lines of treatment; (6) recent or old perforation; (7) severe or repeated mild hæmorrhage; (8) distortion and especially hour-glass deformity; (9) any suggestion of carcinoma. It was becoming generally accepted, he said, that some 10 per cent. of chronic ulcers became carcinomatous. The underlying aim of operation was to bring about certain physiological and mechanical changes which might be produced by entirely different methods. Not long ago gastro-enterostomy was the operation of choice. Its mortality was under 2 per cent., but the safety was largely offset by the risk of persistence of the ulcer. Partial gastrectomy even in expert hands still had considerable mortality and some surgeons had abandoned Polya's operation owing to its danger. Local resection was a much less severe procedure, the mortality in his own cases being 3·6 per cent. The end-results were good with either method. In a series of cases watched for at least five years local resection with gastro-enterostomy had given 88 per cent. of known cures. His own practice was to perform, wherever possible, a local resection with gastro-enterostomy or a partial gastrectomy. Local resection had given him the lower mortality and the higher percentage of late cures while it was free from the objection that it removed a large portion of the normal stomach.

Mr. G. **Gordon-Taylor** said that a survey of the immense literature on this subject had not rendered his outlook any clearer. Apart from the figures of the New Lodge Clinic and the investigations of David Smith, of Glasgow, there was little statistical evidence of an unassailable nature as to the real and permanent value of the medical treatment of gastric ulcer. A year or two ago the "alkaline treatment of ulcer" raised much hope, and many cases were dealt with on non-surgical lines for longer periods than would otherwise have been the case. Some of these, he added, had reached the surgeon at an inoperable stage. Good work had been done by Rendle Short in recording certain statistical end-results from various medical clinics. There was no doubt that medical treatment could cure ulcer of the stomach, and no ulcer should be submitted to surgery which had not received skilled medical treatment, provided that malignancy could be excluded. Short found that 75 per cent. of cases of gastric ulcer could, by medicine, be made symptom-free, but that only 40 per cent. of the patients would remain well, while 15–20 per cent. would be dead in ten years.

NO ONE OPERATION FOR THIS CONDITION.

There was, Mr. Gordon-Taylor declared, no one operation for simple ulcer of the body of the stomach. No surgeon of experience and judgment would press one type of operation for a pathological condition to the entire exclusion of all other methods. The methods of cure should be those which could be safely borne by the patient; but with carcinoma there was justification of heroic surgery to bring about cure. The great skill and experience of Hans Finsterer enabled him to resect almost any ulcer, whatever its position or condition, or at whatever age the patient had arrived; and he had the remarkably low mortality of 2·7 per cent. Mr. Walton employed wedge-resection and gastro-jejunostomy, and in some cases which others not possessing his special skill would not so approach. For more than ten years he had himself been an ardent gastrectomist, but increasing surgical knowledge had shown him that the surgeon must be an eclectic. It was personal experience, not second-hand information, upon which judgment should be based. In the case of a small ulcer on or near the lesser curvature of the stomach no experienced surgeon would perform gastrectomy; the operation of choice was an ulcer-excision or cautery combined with gastro-jejunostomy, gastro-duodenostomy, or some form of pyloroplasty. In addition a drainage or a physiological operation should be done. The value of gastro-enterostomy was greatly enhanced by local treatment of the ulcer itself. From mere gastro-jejunostomy Mr. H. J. Paterson had obtained a mortality-rate as low as 1 per cent.; that surgeon had declared that probably there was no operation which had added more to the sum of human happiness than gastro-enterostomy. For large ulcers of the body of the stomach, especially when adherent to the pancreas, liver, or diaphragm, partial gastrectomy was, Mr. Gordon-Taylor considered, the method of election.

On the relationship of ulcer to cancer opinion had changed during recent years. Hurst and Stewart had stated that 16 per cent. of cancers of the stomach started in an ulcer, and that of 180 chronic ulcers excised, over 6 per cent. had cancer in the margin. The menace of malignancy was therefore a real one. After partial gastrectomy for large ulcers of the body of the stomach, 88 per cent. of his cases had recovered normal working efficiency; no serious or metabolic upset had occurred. In 44 per cent. of the cases a certain degree of anæmia was present, not giving rise to symptoms; it was not pernicious anæmia. An increase in uric acid and blood cholesterol were the only abnormalities found on a chemical examination of the blood. In the intermediate type of case in men he advocated gastrectomy, as the end-results could scarcely be surpassed, and the mortality was low. But in women the end-results were not so good, because of the greater liability to anæmia, not of the Addisonian type. For the ulcer of intermediate size in women he practised where possible either a sleeve resection or a Billroth No. 1 operation if the duodenum was sufficiently wide to ensure a safe anastomosis. Of the extensive "letter-box" or inaccessible ulcer he had had little experience, and less success, with jejunostomy. In the male he was tempted to do gastrectomy, as the results were excellent. Finsterer considered that no ulcer was irremovable. For women having this kind of ulcer it was well to try cholecysto-gastrostomy, or even jejunostomy. In hour-glass contraction the surgical treatment should be governed by the presence or absence of pyloric stenosis, the fixity of the causative ulcer, the site of the stricture, and the sex of the patient. He preferred gastro-gastrostomy for these, with or without some form of pyloroplasty. For hæmorrhage from an ulcer, the treatment was that of the ulcer itself. For perforation he did suture and drainage only. Several times he had successfully dealt with a combination of perforation and hæmorrhage by an immediate gastrectomy. Gastric and duodenal ulcer might exist in the same patient.

DISCUSSION.

Mr. CECIL A. JOLL said that many surgeons used the term "pyloric ulcer" implying that it was a commonly occurring lesion, yet it was very rare for an ulcer to begin within an inch of the gastric aspect of the pylorus. In 916 operations for gastric and duodenal ulcer, there were only four chronic gastric ulcers which could be classed as pyloric. But he had performed duodeno-pylorectomy in 43 per cent. diagnosed as due to pyloric ulceration, in which the original site of the ulcer was the posterior surface of the duodenum. An ulcer undergoing malignant changes was not likely, he thought, to be successfully extirpated by the wedge operation. In the case of large fixed penetrating ulcers, repeated blood transfusion and the use of intravenous glucose, saline infusions and lavage of the stomach enabled partial gastrectomy to be performed without undue risks. Jejunostomy he had found disappointing.

Mr. JOHN MORLEY said it could be considered agreed among surgeons that no single operative method was suitable for all the kinds and situations of ulcer found in the stomach; there should be a readiness to postpone decision as to the kind of operation to be done until the area had actually been exposed. To obtain the best results some form of excision of the ulcer was essential. He was not driven to that view by a fear of malignant change, for malignancy occurred too seldom in a chronic gastric ulcer to influence the choice of procedure. It was often difficult, if not impossible, to determine by inspection whether an ulcer was simple or malignant. Most surgeons had a leaning to a particular operation, and his own preference was for the Schoemacher modification of Billroth No. 1 gastrectomy; this the speaker had performed 119 times for ulcer in the body of the stomach in 119 cases, with three deaths. As to the remote results of this operation, it did not—as the Polya operation did—abolish gastric digestion, nor cause the secondary anæmia which was so frequent. He urged a bolder attitude towards the surgical treatment of bleeding ulcer. Many taught that hæmatemesis should first be dealt with on medical lines, operation being deferred until strength had been restored. But he had seen patients die from a recurrence of hæmorrhage when surgery might have saved them. Until a bleeding ulcer had been excised, there was no certain means of controlling the hæmorrhage.

Mr. CECIL ROWNTREE regarded the discussion as a milestone in gastric surgery. Gastrectomy for ulcer was still on its trial, although four years ago it was coming to be regarded as the only treatment for all kinds of ulcer. The fear that ulcer might degenerate into malignancy was unfounded; he never allowed the possibility to influence his choice of treatment. Gastrectomy was admittedly the correct treatment for the penetrating ulcer which had involved the pancreas. Surgeons, it must be remembered, only treated gastric ulcer after medical treatment had had its chance. For tiny ulcers on the lesser curvature he thought the best procedure was partial gastrectomy, as it seemed to keep the patient free of symptoms afterwards. After gastrectomy he did not think a patient could be regarded, from the life-assurance standpoint, as a first-class life. He had himself adventured in the direction of jejunostomy mainly because he had been much impressed with the relief it gave in cases of inoperable cancer of the stomach. He started doing jejunostomy for ulcers which appeared to be inoperable in ordinary hands, and he had also done it for gastro-jejunal ulcer, and in one or two of the latter the patients were now well. He was now performing jejunostomy for ulcers no larger than a threepenny piece. He had long felt that hæmatemesis should be treated on the same lines as bleeding following gastro-enterostomy—namely, by immediate transfusion and a free opening of the abdomen to discover the bleeding point.

Prof. C. A. PANNETT thought an attempt should be made to apply ordinary surgical principles to hæmorrhage coming from a gastric ulcer. The loss of large quantities of blood brought the patient into a very low condition so that he was not fit for an immediate gastrectomy. The surgeon was seldom called to such a case until the hæmorrhage had been persisting for some days. It was then imperative to determine definitely whether treatment should be medical or surgical; one should not change horses in mid-stream. If surgery were to be given a chance the surgeon must be allowed to see such cases earlier. For very large ulcers he agreed that gastro-jejunostomy was the operation. Small ulcers on the lesser curvature he dealt with differently; if a sleeve resection was done, he thought a pyloroplasty should be carried out also. Where a Billroth No. 1 operation was possible he preferred that to the Polya gastrectomy.

Mr. J. **CUNNING** said he did not agree with Mr. Walton's statement that all ulcers which perforated were chronic ones; such an idea was usually based on the fact that the ulcer was indurated; but if a perforation was a slough, any ulcer could be indurated. He described a case of perforation of an acute ulcer. He did not believe in the danger of malignant degeneration of gastric ulcer; only twice had he seen malignant ulcer with a prolonged history of gastric ulcer.

REPLY.

Mr. **GORDON-TAYLOR** said his feeling now about hæmatemesis was to operate as soon as the bleeding had stopped and the blood pressure had commenced to rise. With regard to carrying out jejunostomy for some of the inoperable or inaccessible cases of ulcer, high up on the back of the stomach, he referred to a patient with perforated duodenal ulcer, which was operated upon 36 hours after the perforation. The ulcer was sewn up and nothing more done. Three days later there was a re-perforation, and a duodenal fistula developed.

Mr. **WALTON** agreed that the end-results of partial gastrectomy were good, and he believed pernicious anæmia seldom occurred. He had never seen a case of secondary anæmia become pernicious; if it occurred it must be very rare. With regard to laparotomy for perforation, at one time there existed a feeling that the abdomen should be closed almost at once. He always liked to carry out slight suprapubic drainage, and if there were a widespread infection he also drained from the stomach. He had never known trouble arise from drainage, but he had known difficulties to occur when drainage was omitted. A pyloric ulcer he conceived of as one which extended over a portion of the stomach; he had seen cases in which such an ulcer had healed as far as the duodenal side was concerned, but had developed carcinoma on the gastric side. However small that kind of ulcer might be there was the possibility of its becoming carcinomatous. He believed that 10 per cent. of carcinomas in this region originated in ulcer.

SECTION OF LARYNGOLOGY.

A MEETING of this section was held on May 1st with Mr. **FRANK ROSE**, the President, in the chair.

Upper Œsophageal Obstruction.

Dr. A. **BROWN KELLY** (Glasgow), in opening the discussion on obstruction at the upper end of the œsophagus (excluding diverticula), said that the more pronounced the stenosis the earlier the dysphagia became manifest and the greater was the menace to life. A consideration of these abnormalities should embrace their effect in the newly born, the young child, and the adult. First, in regard to atresia with œsophagotracheal fistula, he said that atresia was the most serious maldevelopment of the gullet, for the issue was always fatal. Seldom had the condition been better described than by Morell Mackenzie in 1884. In the commonest variety the atresia was associated with an œsophageal fistula. Here the upper part of the œsophagus ended blindly above the level of the bifurcation of the trachea, while the lower part passed up *from the* stomach to the posterior wall of the trachea, where it opened as a fine fistula. The signs were those of obstruction high in the œsophagus, so that from time to time the child coughed, choked, and became cyanosed because it could not swallow the accumulated saliva and mucus. A small bougie which it was attempted to pass was checked at a distance varying from 9 to 13 cm. from the gums. Usually in this condition one could find other congenital abnormalities also, imperforate anus being the commonest of these. In order to prove that a stenosis of the œsophagus was congenital it was necessary to ascertain that dysphagia and regurgitation had been present from birth, or at least from the date when the child was first given solid food; and either endoscopic examination during life or a post-mortem examination should show a smooth lining membrane, without any evidence of cicatrisation.

Referring to cases in which narrowing occurred at a lower level, Dr. Brown Kelly said these caused, in children, symptoms whose severity was intermediate between those of atresia in infants, and those of stenosis in adults. When narrowing of the lumen was not very severe no sign of œsophageal obstruction might be noted until attempts were made to give semi-solids, from which time onwards meals were constantly being brought up. At quite an early stage radiographic examination and endoscopy should be carried out. The constriction was usually found to be opposite the seventh thoracic vertebra.

Speaking next of stenoses at the upper end Dr. Brown Kelly said that the prevailing ignorance of both the normal and diseased conditions in the hypopharynx and upper end of the œsophagus was due to the difficulties encountered in the chief methods of examination—i.e., X rays and endoscopy. So quickly was the bolus of food projected into the gullet that one could not make deliberate inspection of what took place during this transit. Perhaps the cinematograph could fill this hiatus. The passage of an endoscope might be much hindered for a time by spasm of the cricopharyngeus muscle; and a further difficulty was the want of orientation landmarks, so that a delicate membrane might be ruptured even before it was seen. Narrowing of the lower part of the hypopharynx or upper part of the œsophagus could be due to a membranous diaphragm, fold, or ledge, or to a diminution in the size of the lumen.

Congenital stenoses at or near the upper end of the œsophagus were very rare. Morell Mackenzie called this condition "simple stenosis of the gullet," and said it was an abnormal narrowness of a limited part of the œsophagus without morbid changes. The speaker showed a specimen from a case of congenital stenosis at the entrance to the œsophagus, in which there was a gradual and uniform narrowing of a length of 1 cm., and beyond it the lumen of the œsophagus was normal. The lining of the funnel-shaped stenosis was quite smooth, suggesting a congenital origin. This patient was a man, aged 35, who died from cerebral hæmorrhage.

In a few of Dr. Brown Kelly's cases the narrowing was produced not merely by spasmodic muscular contraction but also by a circular membranous web with an aperture 3 or 4 mm. in diameter. A few patients who had malignant disease at or near the mouth of the œsophagus said they had had difficulty of swallowing since early childhood. Logan Turner had found in 94 cases of post-cricoid cancer that four of the patients stated they had had "a narrow throat" as long as they could remember.

Dr. Brown Kelly referred to the occasional presence, at the upper end of the gullet, of islands of gastric mucosa. To the unaided eye these appeared as sharply demarcated oval patches, yellowish-brown in colour, and they were liable to be mistaken for superficial erosions. Usually these islands were found between the lower end of the cricoid cartilage, and the level of the seventh or eighth tracheal ring on the lateral part of the posterior wall. They were commonest in adult life, but might be met with at all stages of development. Such islands were sharply demarcated from the surrounding stratified squamous epithelium of the œsophagus by the surface becoming irregular owing to the presence of a number of long papillæ, between which were deep pits.

SPASM AND STENOSIS.

Dr. D. R. **Paterson** (Cardiff) followed. He said he considered that obstruction at the upper end of the gullet could be due to two kinds of causes: spasm at the entrance, and malignant disease. His purpose was to raise some problems for discussion.

In 1919 Dr. Brown Kelly and he had drawn attention to a clinical syndrome in women chiefly characterised by a gradually increasing inability to swallow, because of spasm of the pharyngo-œsophageal sphincter, and, at a later stage, anæmia. The latter could be looked upon as a secondary manifestation of the dysphagia. A peculiar point was that he had never seen this form in a man, in which sex the obstruction was usually a malignant one. Sometimes spasm was met with in a man, but it was usually an accompaniment of malignant stricture further down. The women he referred to usually came under observation first in middle life, often giving a long history of dysphagia, which had latterly slowly restricted them to liquid food. Some of these cases were incorrectly labelled hysterical. From an early stage they might show slight changes in the mouth, possibly no more than a mild atrophy of the tongue papillæ. Only later did superficial glossitis appear, the tongue being smooth and devoid of papillæ. This atrophic change in the mucous membrane was related essentially to the food passage, and not to the air tract. Even marked atrophic pharyngitis resulting from nasal disease was rarely accompanied by dysphagia. Cases were met with of a web at the entrance of the gullet, and Mosher had pointed out that frequently the use of a tube without due observation removed a web. Anæmia was a late symptom, and was of gradual development. Munro Cameron had stated that the blood changes were essentially those of chlorosis and mild secondary anæmia, with a constant reduction in the hæmoglobin percentage.

Immediately after the passage of a tube there was an increased capacity to swallow, and if the patient was now told that she could swallow solid food she soon improved in general condition. Cures were not always permanent; in some of the patients the return to normal was not complete, and some dysphagia might persist; this was much relieved by the occasional passage of a bougie. It was the speaker's experience that malignant disease was often a late sequel of this syndrome.

With regard to malignant disease in the part concerned, Dr. Paterson drew attention to some of the salient facts which had been established by Logan Turner. One was that carcinoma at the upper end of the gullet was more common in women than in men, also it was met with at an earlier age in females than in males, 20 to 30 years of age not being uncommon in the former. A review of hundreds of cases of cancer of the œsophagus showed that at some stage each one had been diagnosed as hysterical dysphagia. Pain, which was often localised to one side, and was also felt in the ear, was almost symptomatic of grave change, and so should direct attention to that side of the hypopharynx.

The problem of the treatment of malignant disease in this region was, said Dr. Paterson, entirely bound up with its early detection. The laryngoscope, œsophagoscope, and X rays should all be brought into requisition. Only when the disease was limited did surgery give hope.

Dysphagia was only occasionally due to webs, a common site for which was behind the cricoid cartilage. Some, those which were thin and slight, could be disposed of by passing a tube, but others were thicker and might support a shallow pouch. Dr. Paterson thought that the whole subject of webs was worthy of further discussion.

ILLUSTRATIVE CASES.

Prof. Georges **Portmann** (Bordeaux) spoke of two cases of the kind under discussion. One was a woman, 20 years of age, the other a man, aged 45. Both had stenosis of the hypopharynx, not congenital, nor consequent upon trauma; no syphilis, lupus, or other disease could be incriminated. The condition was a gradual concentric stenosis by fibrous tissue. He was compelled to do first tracheotomy, then gastrostomy. He used diathermy as the treatment, and both patients were now cured. They had not a normal hypopharynx, but they were able to swallow and breathe.

Mr. Herbert **Tilley** said that in 30 years he could recall only one case which came to his personal knowledge at the hospital as a congenital atresia of the gullet. That child died in three days. As to the possibility that functional aphonia might be a precursor of malignant disease, a lady was sent to him because she had difficulty in swallowing. He passed a bougie, and a fortnight later she had no further difficulty. Five years later she was losing flesh and had great difficulty in swallowing. When he saw her again at this later date she was very thin, there was a little bright blood in the right pyriform sinus, and he was unable to pass a bougie. A post-cricoid cancer was found, and two or three months later she died. If a patient having obstruction was relieved by the passage of a bougie, and then returned after a short time, it called for a direct examination of the gullet. Youth in the patient was no guarantee that the condition was not malignant. He spoke of the case of a medical man who consulted him because of pain in the throat and difficulty in swallowing; he also had joint pains. He was found to have intense œdema of the left arytenoid and fixation of the corresponding cord. He had had acute rheumatic fever. He got well under treatment, and six months later the œdema had disappeared and the cord was moving normally. Mr. Tilley also described other cases.

Mr. V. E. **Negus** described the case of a patient (whom he showed) with an inflammatory swelling of the ary-epiglottic folds. She was aged 54, and her complaint was of a throbbing of the throat and of the formation of a "froth" there. Swallowing was not interfered with. On indirect examination one saw a regular, firm, red swelling in the posterior region of the ary-epiglottic folds; but there was no ulceration, nor was any neoplasm seen; the Wassermann reaction was negative, and there was no secondary anæmia. It might be merely an inflammatory swelling of the larynx.

Mr. A. J. M. **Wright** (Bristol) said he had been watching cases with the condition under discussion for 23 years. The condition of glossy tongue with dysphagia he thought was originally a chronic infection, which probably explained the fact that these patients when seen, though in many cases young, were almost always edentulous. It would be of great practical interest to know how often a late sequel of the condition was the formation of new growth. Hot tobacco smoke had been invoked as a possible determinant of carcinoma of the tongue, so in women the drinking of hot tea could be indicted.

Dr. **Douglas Guthrie** (Edinburgh) alluded to some cases in which various abnormalities of the gullet occurred. One was that of a child 8 months of age, which obviously had difficulty in swallowing, though it was possible for it to take nourishment. At the entrance to the œsophagus he found a soft growth, resembling a nasal polypus. He removed it under suspension laryngoscopy, passing a snare under the cyst, when it collapsed. The contents were not clear, but milky looking.

Mr. W. S. **Thacker-Neville** (Harrogate), referring to the statement that the drinking of hot fluids, such as tea, might cause cancer, said the Chinese were addicted to very hot tea-drinking, yet during the time he was in that country he did not see a case of post-cricoid carcinoma.

Dr. R. S. **Johnson** spoke of a series of cases of combined anæmia and dysphagia which were in St. Bartholomew's Hospital under Dr. George Graham, the ages of the patients ranging from 33 to 48. All showed a very low colour-index, and the anæmia was of the secondary type. In one the œsophagoscope could not be passed, owing to the spasm. The cases showed achlorhydria. He suggested that in this type of case there was a specific kind of anæmia, associated with a slightly increased fragility of the red cells, with achlorhydria and secondary changes in the mucous membrane of the tongue and the œsophagus.

MEDICAL SOCIETY OF LONDON.

THE ANNUAL ORATION.

At the general meeting of this society on May 11th, with Dr. R. A. **Young**, the President, in the chair, Sir **John Rose Bradford** delivered the Annual Oration, taking for his subject

Medicine as Science and an Art.

The last 50 years, he said, had not only been marked by numerous great discoveries in the realm of natural knowledge, but had been more especially remarkable for the rapid application of those discoveries to the practical needs of humanity. The very benefits which these discoveries had conferred led necessarily to some confusion as to the real relationship between scientific discovery on the one hand and its practical application on the other. The ever-increasing demand for practical applications and benefits was apt to dominate the situation and might even affect the mental outlook of those whose primary purpose was only to add to knowledge. The chemical or physical problems involved, for example, in the production of artificial silk, in wireless communication, or in the steam turbine, were really only fully appreciated by the experts in the particular branch of science concerned, and were often difficult of apprehension by a worker in another branch. When the practice of an art was founded on the achievements of a science, differences between the modes of thought of workers in the science and those engaged in pursuit of the art were apt to become accentuated; two camps were likely to be formed, and it was even possible for the one to doubt the value or even the very existence of the science in question, while the other asserted that all would be well if the so-called art were replaced by something which they could regard as science. Many doubted whether medicine was a science, but a practitioner could not exercise his art efficiently unless it were well grounded on scientific principles.

THE SOLDIER AND THE DOCTOR.

In many respects the profession of medicine resembled that of the soldier even more than that of the engineer, with which it was often compared. The soldier and the doctor both had to grasp a situation and determine with little or no delay a course of action; he had to have instinct or flair, military in the one case, clinical in the other; and both were useless unless their instinct was based on and regulated by sound general principles which owed their origin to the study of the science of war and of medicine respectively. A favourite definition of science was "measurement," but a wider outlook might be more satisfactory, and the orator quoted Ruskin's definition that the work of science is to substitute facts for appearances and demonstration for impressions. Such a definition was closely applicable, he said, to the science of medicine. Looked at from a particular standpoint, medicine was of course but a branch of biology, most akin to the subdivision of biology known as natural history. Many might be inclined to take a narrower view of the essential nature of medicine, and regard it as merely a deranged or abnormal physiology, for the connotation of which, for the purposes of convenience, the terms "pathology" and "pathogeny" had been applied. But the natural history of an animal or plant dealt with much more than purely physiological processes, and many of the phenomena of living organisms could not be fully investigated either in the laboratory or by the methods of the laboratory alone. To acquire a satisfactory knowledge of the life processes of an animal or plant, both the methods of study practised in the laboratory and those practised in the field were required, and it was unfortunate that both in biology and in medicine there should be a divergence of view about the relative importance of the one method and the other. What fundamentally mattered was that the pursuit of natural history in the field of clinical medicine in the wards should not suffer because supposed to be of less importance or to require a smaller degree of equipment, mental or material, for its pursuit. The two classes of workers must pursue different methods, but should both take to heart the dictum of Ruskin quoted above. The science and art of medicine or the principles of the practice of medicine were often represented pictorially by a book and the well-known caduceus, with the twined snakes, the former representing the knowledge and science of medicine, and the latter the practice of the art. That was a suitable picture, but one vital proviso must be added—namely, that the book should be regarded as the book of nature, or as Longfellow put it, "the manuscripts of God."

THE BOOK OF NATURE.

The dark ages of medicine for centuries before the advent of Harvey were in no small measure attributable to the book of nature not having been consulted, and reliance having been placed on authority, or the book of man. Harvey consulted the book of nature himself, and proceeded to ask a series of masterly questions, finding answers which established scientific medicine. In the progress of science the gift or discovery of a method of inquiry was often of more service even than the discovery of a great fact, and medicine in the person of Harvey had rendered not only great but possibly the greatest assistance to the progress of all biological sciences. The experimental method in these recent years had extended the scope of its operations to a most remarkable extent, so that at the present time much of the work of the biologist and botanist was performed with its help. In fact, the modern biologist paid an ever-increasing attention to problems capable of solution by the experimental method rather than to problems of morphology; in other words, function was being more considered than structure. Although medicine was profoundly indebted to other sciences in its own realm, the relationship was not entirely unilateral. It was natural and quite excusable for the great public to fail to recognise the value of so-called abstract research, but members of the profession of medicine, whose daily work afforded them countless instances of the priceless material benefits which had accrued to their art as a result of such work, should be chary of belittling research whose practical application was not apparent.

The science of medicine might be said to have for its field the study of the phenomena of disease as a whole and the means best suited for its prevention. The art of medicine was concerned mainly with the problems encountered in our attempts to recognise the presence of disease in individuals and to treat it. Naturally, no absolute hard-and-fast line could be drawn between the science and the art in given instances, though knowledge of the prevention of disease might reach a very high level of development from the purely scientific standpoint while failing in its application owing to imperfections in the study of the art of medicine in the clinical field. Medicine as a science was no mere appanage of anatomy or physiology or pathology. There was something else, which it was difficult to describe accurately in words, but might be conveniently summed up as the natural history of man. The natural history of diseased man was, of course, the special study of clinical medicine. Clinical medicine, like field natural history knowledge, was not easy to acquire. Both necessitated a long apprenticeship; often prolonged time was required to afford opportunity, and, further, it was exceedingly difficult to acquire habits of observation which reached the high standard of scientific accuracy.

To have a really comprehensive view of medicine it was essential not to confine the attention to human medicine. The consideration of disease in animals, at any rate domestic animals, must be included. This was important not only from the point of view of communicability of disease, but also from the far wider point of view of checking any tendency to narrowness of outlook and dogma in respect to the true causation of any disease. The comparative method had always exercised a broadening influence on the human mind, and might be applied with advantage to medicine as well as to anatomy and physiology.

CONCLUSION.

In conclusion, Sir John Rose Bradford said that his aim had been to insist that further progress must be based rather on the mental views held by the disciples of medicine than by the mere use of increased instrumental or chemical agencies now available for their service. If medicine was regarded as an appanage of physiology or even of pathology, possibly great advances might be made by individual discovery, but such discoveries would often not only be of limited scope, but still more often very difficult of application when they were removed from the relatively simple conditions of the laboratory to the complex field of operations of clinical medicine. Clinical medicine still offered plentiful scope as of old for those gifted with real powers of scientific observation, and important as the experimental method was, and valuable as the instrumental aids, these were not by any means the sole methods of advance, either for the science or for the art of medicine.

A vote of thanks to the Orator was proposed by Dr. HERBERT SPENCER, and seconded by Mr. DONALD ARMOUR, and heartily carried.

MANCHESTER MEDICAL SOCIETY AND PATHOLOGICAL SOCIETY OF MANCHESTER.

AT a joint meeting of these societies on April 15th, with Mr. J. HOWSON RAY in the chair, an address on

Epidemic Encephalitis

was given by Prof. ARTHUR HALL (Sheffield). He began by giving an account of the acute cases, which first appeared in 1916 and recurred in epidemic waves during the next seven or eight years. He called attention to their periodicity, to the variability of onset in individual cases, and to the extreme differences of reaction to infection. In some cases the acute attack presented no diagnostic features, in others quite definite stigmata showed themselves, whilst in a third group there was no recognisable illness at all, the first symptoms appearing only at a later period and in more chronic form. During the last five or six years the number of acute cases had steadily diminished. Undoubtedly, sporadic cases were still occurring but they were few in number, and in this country no epidemic outbreak of any magnitude had followed that of 1924. To-day it was the chronic progressive disease which showed itself, chiefly, though not solely, as parkinsonism. The destruction of cells in the substantia nigra found in such cases supported the view held by most clinicians, that parkinsonism is a chronic progressive encephalitis of active kind rather than a mere passive residual effect of the acute attack.

What, asked Prof. Hall, was the future of those mild and partial cases of parkinsonism which had so far remained stationary for periods varying from 7 to even 10 or 11 years?—Had the activity of the process ceased or was it only temporarily arrested? As most of the patients were young persons at an age when marriage and choice of occupation had to be considered, important decisions often depended on the answer to this question. The difficulty was great because there were no precedents. A second question was: Would the epidemic waves recur? Whilst there was evidence that since 1924 the number of new cases had been steadily diminishing, yet judging by the behaviour of other neurotropic epidemics it would be rash to prophesy that they would continue to diminish.

NOTTINGHAM CHILDREN'S HOSPITAL.—The result of the recent enlargement to 100 beds is that last year there were 920 in-patients as compared with 660 in 1929, and that at 424 the number of operations nearly doubled. The hospital is now a recognised nurses' training school.

REVIEWS AND NOTICES OF BOOKS

Principles of Epidemiology and the Process of Infection.

By C. O. STALLYBRASS, M.D., D.P.H., Chief Assistant Medical Officer of Health, City and Port of Liverpool; Lecturer on Vital Statistics and Epidemiology, Liverpool School of Tropical Medicine. London: George Routledge and Son, Ltd. 1931. Pp. 696. 30*s.*

THIS book represents a departure from the traditions of literature on public health at least in this country. It is an attempt by a medical practitioner engaged in the day to day work of a health department to bring within one compass the sum of our knowledge of epidemics, and of present-day methods of approaching the still obscure problems of epidemiology. Obviously, such a programme must cover the history of epidemics, statistical ways of studying them, their environmental, bacteriological, and immunological conditions, their cyclic and seasonal variations, and their susceptibility to practical measures of control. Moreover, if the book is intended primarily for the medical officer of health, as this is, it should be sparing in reference to the more intricate refinements of special subjects like bacteriology and statistical methods, although they have an important bearing on the main topic. On the whole, if these criteria are accepted, Dr. Stallybrass has succeeded in his purpose. Not every public health administrator, who ought to be equipped with information which has a practical bearing on the control of communicable disease, has a sufficient grounding in mathematics to understand the chapter on statistical methods, and possibly too much has been crowded into chapters which deal with micro-organisms, their invasion of the human body, and the resistance they provoke. Indeed, the impression is gathered that Dr. Stallybrass has had some difficulty in discarding from his very wide knowledge of the branches of science ancillary to epidemiology. His book is therefore not easy to read. It should be considered, however, as a book of reference, and in this respect it supplies a want which has been felt to an increasing extent in recent years as a result of the rapid progress of inquiry into the causes and behaviour of epidemics. The book is not free from defects in proof-reading, although they are not unduly prominent. There are a very few errors of a more serious character which will require correction in any future edition—e.g., the equation "Mortality-rate = morbidity-rate × fatality-rate." The index is complete and reliable. An extensive and well-selected bibliography of about 800 publications bearing on the matters discussed in the body of the book is a useful feature.

As a work of reference this book will be invaluable to medical officers of health and teachers of preventive medicine.

Physical Diagnosis.

By WARREN P. ELMER, M.D., Associate Professor of Clinical Medicine, Washington University; and W. D. ROSE, M.D., late Associate Professor of Medicine, Arkansas University. London: Henry Kimpton. 1930. Pp. 903. 42*s.*

THIS large volume is divided into two parts. The first and rather larger section concerns itself in minute detail with the time-honoured methods of physical examination—inspection, palpation, percussion, and so forth—together with an exhaustive analysis of the results obtained. Some of the detail might be spared, even by the beginner. For instance, it is noted that the intensity of vocal fremitus varies directly with the intensity of the speaking voice, and that when the voice is increased the fremitus follows suite, and vice versa. Many interesting points in the mechanism of the production of physical signs are set out. One short chapter is devoted to "Palpation of the Lower Extremities," but it is doubtful if so methodical a system in diagnosis as a complete physical examination of the human body in every case is of great value, apart from relevant symptoms. The chapter on radiographic methods by Dr. Sherwood Moore is good and excellently illustrated, and the short chapter on electrocardiography is useful.

It is disappointing, when we come to the second part of the book, where these elaborated methods should find application, to discover that it is limited to the diseases of the respiratory and circulatory systems. Thus all the detailed topography of the abdomen and the methods of its inspection and palpation, as well as the chapters on speech, gait, and station, on inspection of the head and face, and of the inguinal, genital, and perineal regions, found in Part I., do not come to any particular fulfilment as far as this work is concerned. The chapters dealing with pulmonary and circulatory disease are very full. It may be doubted whether a work only on physical signs, excluding all consideration of symptoms, may not encourage students to see the trees rather than the wood. There are 337 excellent illustrations.

Taylor's Practice of Medicine.

Fourteenth edition. By E. P. POULTON, M.A., M.D. Oxf., F.R.C.P. Lond., Physician to Guy's Hospital. With the assistance of C. PUTNAM SYMONDS, M.A., M.D. Oxf., F.R.C.P. Lond., Physician in Charge of the Neurological Department of the Hospital; and H. W. BARBER, M.A., M.B. Camb., F.R.C.P. Lond., Physician in Charge of Skin Department; and R. D. GILLESPIE, M.D. Glasg., M.R.C.P. Lond., D.P.M. Lond., Physician for Psychological Medicine to the Hospital. London: J. and A. Churchill. 1930. Pp. 1074. 25*s.*

IT is 40 years since the first review appeared of this popular treatise in our columns, and looking back at our words we think that to a great extent they forecasted what would be its happy destiny. We congratulated the author then on the comprehensiveness and the able selection of his material, on the proportion observed between the various subjects, and on the accuracy in details, closing with the statement that the book would be certain to become a welcome guide to the students of the future. We have now received a copy of the fourteenth edition of the book, which has appeared at average intervals of three years since its birth.

A quotation by Dr. E. P. Poulton from his preface to the twelfth edition indicates his ideal in dealing with a classic, so as to render the teaching practically modern while maintaining a general plan whose value has been so prominently proven. Completeness, this preface indicates, must always be aimed at, and yet the main scope of the book should remain unchanged. To reconcile these contradictories in a text-book which displays the practice of a science that itself is ever changing, by the addition of the needful and the discarding of what has been superseded, has been the work before the editor, who has felt that it could only be undertaken if the revision of the greater part remained in one hand, while assistance was freely invited to deal with certain specialties. The longest interval between the various editions has just occurred, and during this space of about five years the advance in all branches of medicine has been considerable. This has led to new articles on the streptococcal and staphylococcal infections, to the rewriting of the account of acute rheumatism so as to include chorea—with the result that the disease is now classified as one of the circulation—to new treatment of such subjects as coronary thrombosis, the acute abdomen, chronic cerebral softening and cerebral contusion, and chronic gastritis. Indeed, there is scarcely a page which has not been altered in conformity with the changes in accepted knowledge or theory. Further, the utility of the teaching has been raised in a high degree by such rearrangements of material as that which has occurred in the case of rheumatism. In previous editions many subjects, as mental diseases and the pathology of parasites, received scattered notice throughout the book, while the information concerning them has now been collated in special sections. With regard to mental diseases an article now appears by Dr. R. D. Gillespie, who remains in charge of this section of the work, on the legal relationships of these diseases, one by Dr. C. P. Symonds on the psychoneuroses finding appropriately its place in juxtaposition. Tropical diseases have been grouped in one section, and this part of the volume has been revised by Dr. Dyce Sharp and largely rewritten, while Dr. Barber has revived the dermatological sections.

Dr. Poulton makes detailed acknowledgment by name to a large group of authorities who have assisted him along the various lines into which the practice of medicine is now necessarily divided for intensive study, and by preserving the balance which has always been characteristic of "Taylor" has produced a new edition which is sure to find continued favour.

There are 64 plates (12 coloured) and 103 text-figures, including many radiograms. The increasing value of adequate illustration in clinical text-books is thus cared for.

La cryothérapie.

By Dr. LORTAT-JACOB, Physician, Hôpital St. Louis, Paris; and Dr. G. SOLENTE, Assistant Physician. Paris: Masson et Cie. 1930. Pp. 246. Fr.35.

COLD as an agent in the therapeutics of skin disease appears to have been initiated by Kaposi who applied a vessel containing ice to a few patients suffering from lupus erythematosus; but its real origin was in the attempts to utilise methyl and ethyl chloride as local anæsthetics in 1882. It was not until 1896, however, that Ullmann of Vienna published the first practical results in his treatment of angiomata by the latter substance, followed in 1901 by Dethlefsen who applied it for the cure of lupus and cutaneous cancer. The discovery of liquid air in 1884 initiated a new epoch in the history of congelation. It remained too costly and uncontrollable for general use, although A. C. White did much good work with it in the Vanderbilt clinic in New York. It was left to his countryman W. A. Pusey to devise an agent, solid CO_2, which ever since 1905 has not only proved of immense value in the treatment of localised cutaneous abnormalities, but vies with radium and other modern weapons in quite a number of departments remote from dermatology—for example, ophthalmology. Much that is collected in this volume has been known for years—the method of preparation and collection, the various sized cones for making the "pencils," the indications for treatment, and the comparative safety with which, even in inexperienced hands, good results can be obtained. The effects are the product of two factors: (1) the duration of the exposure, and (2) the pressure applied, and the latter, if the operator is a novice, can be accurately adjusted by means of the apparatus described in this book. The number of cutaneous conditions that can be treated by freezing is surprisingly large and ranges from chilblains to cancer. The authors use it for rosacea, in some forms of which localised papules and telangiectases are a pronounced feature. Even septic conditions such as indolent ulcers, and the hæmorrhagic forms of granuloma pyogenicum are amenable, while for vascular nævi it is the treatment of choice. The whole subject is methodically discussed. The histological effects are illustrated by microphotographs, and special sections are devoted to the modifications imposed by the topography of the lesions such as those in the eyelids, the alæ nasi, or the aural cartilages, in which localised disease or stigmata are relatively common.

This volume reveals a series of indications which, in view of the modern popularity of the various electrical and ray treatments, may have escaped the notice of even experienced dermatologists, while the simplicity of the technique, the relative immunity from complications, and the almost perfect cosmetic results, make their special appeal to the general practitioner.

The Charaka Club, 1931.

Proceedings of the Charaka Club. Vol. VII. New York: Paul B. Hoeber. 1931. Pp. 190. $5.00.

THIS is the seventh volume of the well-known Proceedings of the Charaka Club, and like all its predecessors provides a medley of wisdom, learning, research, and fun. The book is prefaced by a list of the members of the body, who may be congratulated on the number of names now appearing which previously appeared 20 years ago—the members live long, as witty men should. The present volume contains no exactly medical article, but the contents will appeal to all medical men who seek and find interest in the history and traditions of their profession, and its associations with literature. An essay on the education of the Barber-Surgeons in France by Dr. E. C. Streeter, is an informing history of the growth and development of surgery in mediæval France; a paper by Dr. F. R. Packard on the Journal of Jean Héroard, Physician to Louis XIII., throws an intimate light on domestic medicine in the same country in the sixteenth century. This contribution owes its origin to a manuscript preserved in the Bibliothèque Nationale at Paris, and only a certain portion of it has ever been published. It forms a minute history of the earlier bringing up of Louis XIII., starting with the accouchement of Marie de Medicis, the second wife of Henry IV., and includes an instructive list of the medical establishment attached to the court, 21 in number, with different duties assigned to them. The volume includes a selection of verses, grave and gay, by Dr. G. D. Stuart, and many illustrations, of which the best are those which accompany Dr. R. L. Dickinson's chapter on Chinese boats.

THE LANCET.

LONDON: SATURDAY, MAY 16, 1931.

SPLENIC FUNCTIONS AND DISEASES.

Readers of the Lettsomian Lectures at the Medical Society of London, reported in our columns of this and two previous weeks, have now been presented with what is really a monograph on "the spleen and its sufferings," to quote the convenient inclusive title of an address given by the late Sir Frederick Taylor before the Midland Medical Society in November, 1905. This difficult subject, long the field of hypotheses, has recently, like other branches of medicine, been extensively investigated and advanced; but, except for Lord Moynihan's volume on "The Spleen and Some of its Diseases" ten years ago, has not been exhaustively reviewed in this country, and so is in need of a scientific summary such as Dr. J. W. McNee here provides. In doing so he has returned to a subject to which he has in the past made notable contributions; in addition to work on the reticulo-endothelial system, of which the spleen is such an imporant site, he has specially investigated its normal structure and brought order into the grouping of its morbid changes. The spleen being in the portal system and containing so much lymphoid tissue may therefore naturally share in the diseases both of this system and those of the blood-forming organs, as was shown in H. Eppinger's valuable book "Die hepatolienalen Erkrankrungen" 1920, a subject which has not escaped the attention of this year's Lettsomian lecturer. In order to understand the disorders and the significance of structural changes in an organ, it is obviously essential to have an accurate knowledge of its functions and normal anatomy. The physiology of the spleen is beset with difficulties, it is not a vital organ, and its numerous functions are shared by other parts of the body and can thus be compensated when it is removed or damaged. Hence experimental excision or extensive disease does not give rise to manifestations which reveal its functional activities in the same clear and unmistakable manner as in removal of the thyroid or parathyroid glands.

It is therefore well that beginning with an attractive historical review Dr. McNee has cleared the ground by a summary of our present knowledge of the physiology and anatomy of the spleen. It is perhaps noteworthy that the contractile power of the spleen, postulated as long ago as 1722 by William Stukeley in his Goulstonian lectures at the Royal College of Physicians of London, was not fully investigated and established until 1881 by C. S. Roy, then George Henry Lewes student at Cambridge, where 40 and more years later Barcroft and his co-workers made it permanently obvious. The discussion of the relation of the spleen to the digestive processes, and especially to fat-metabolism, shows that our knowledge of the physiology of the organ is still far from finality. Some of the details of the structure of the spleen recently brought forward, such as the "ellipsoids," are really re-discoveries of what was once known, but then forgotten. The significance, otherwise uncertain, of the anatomical make-up of the organ has been elucidated by the assistance of physiological methods; thus the problem whether the intrasplenic circulation is completely closed or open, or a combination of the first two alternatives, has been brought, by Barcroft's experiments with CO and those of McNee and M. F. Cashin on other lines, to the conclusion that there is a two-fold circulation; the first is the ordinary circulation through the splenic artery, venous sinuses directly into the splenic vein; the other, intermittent, is brought about by contraction and relaxation of the whole organ, and consists of an emptying of the pulp spaces through the wide stigmata into the veins, and a filling again through the lateral channels in the ellipsoids.

As a classification for ordinary purposes of the diseases of the spleen, Dr. McNee suggests the adoption of one partly based on the histological changes in the chief constituent elements of the organ, namely: (1) the myeloid and lymphatic; (2) the endothelial (the reticulo-endothelial system); (3) the vascular system with its special peculiarities; and (4) the reticulum and supporting tissues, the trabeculæ, and the capsule. In addition to the first three of the above categories he now proposes groups headed abnormalities, tumours, infections, and combined diseases of the spleen, liver, and hæmopoietic system, making seven in all. His systematic and detailed account of the diseases met with in this country is largely derived from personal observation of clinical cases and pathological examination of many more than the 100 spleens on which he based his former classification in 1929; there is admittedly little about tropical splenomegalies or morbid changes in the spleen occurring incidentally in generalised conditions such as syphilis, tuberculosis, Hodgkin's lymphogranuloma, and leukæmia. Attention may be specially directed to the three types of disease included under the heading of those affecting the reticulo-endothelial system—namely, chronic hæmolytic jaundice, disturbances in lipoid metabolism leading to Gaucher's and Niemann's diseases, and to hypercholesterolæmic splenomegaly in diabetes mellitus, and thirdly, chronic splenomegalies of unknown origin showing well-marked proliferation of the reticulo-endothelial cells with giant cells, sometimes in such large numbers as to simulate a myeloma, but not megakaryocytes from the bone-marrow. The nature of these cases, in which the spleen may be very large, is obscure, and Dr. McNee can only suggest that they represent the response of the reticulo-endothelial cells to very chronic inflammation. The group of diseases affecting the vascular system of the organ forms the largest of British splenomegalies, and includes many cases labelled chronic splenic anæmia and those due to thrombosis of the splenic vein. Splenomegaly, associated with peri-ellipsoid hæmorrhages and nodular siderosis, is not only extremely frequent, but has excited a considerable literature not devoid of a controversial character. Scattered over the cut surface of the organ are irregularly shaped, yellowish-brown nodules, the Gandy-Gamma or Gandy nodules, which contain iron and calcium; they were regarded by A. G. **Gibson** in 1913–14, and after the war by **Nanta**, **Pinoy**, **Gruny**, **Emile-Weil**, and other French observers, as due to mycotic invasion. But **McNee** strongly opposes this view and regards them as the result of past hæmorrhages.

Though these lectures are full of personal observation, and show a critical knowledge of the vast literature of the subject, they do not profess to be a final pronouncement, and those keenly interested in this instalment of the lecturer's results and conclusions will anticipate further instruction from him in the future.

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THE BASIS OF PUBLIC HEALTH LAW.

The fundamentals of public health law in America have lately been analysed by an American health official[1] under the triple headings of statutes, regulations, and precedents. The same three headings would stand as the fundamentals of the law in England also, but in England they would not mean quite the same thing. By statutes in England we understand the Acts of a single supreme and sovereign Parliament. In America statutes mean the State and federal constitutions and the legislation of congress and of the various State assemblies; there is a dualism of State and federal law-making. Public health law in America reveals itself on analysis as part of the "police power"—namely, the inherent sovereignty exercised by governments for the protection of morals, safety, well being, and good order. When the Federal Government was created in America and was entrusted by the several States with certain rigidly limited powers, the States reserved to themselves the sovereign control over their own internal affairs. Public health legislation, therefore, is a power necessarily exercised by each separate State for itself; it is not a power of the Federal Government unless there is some external or inter-State aspect such as the quarantine of immigrants. The famous Fourteenth Amendment to the Federal Constitution may be invoked to challenge any arbitrary invasion by a State of an individual's rights of "life, liberty, or property" and to contest any State law which can be stigmatised as unequal or partial in its application. The Fourteenth Amendment, however, has been overworked; it was never designed to interfere with the proper exercise of police powers by a State legislature, as the American courts have frequently observed. Public health, then, is mainly a matter for State legislation. The second fundamental (regulations) means much the same to Americans as it means to us—the rules and ordinances of health boards and municipal councils. There was for a time some doubt in America whether the legislature could delegate rule-making power to an administrative body. In a Wisconsin case it seems to have been held that the State board of health was a purely administrative unit possessing no regulatory power and incapable of receiving it. But the United States Supreme Court and various States Courts have removed the doubt and have made it clear that the State legislature may delegate the regulatory authority. In England, as the Donoughmore Committee on Departmental Powers will doubtless tell us when it produces its report, the delegated legislation of departments and local bodies has long been an accepted feature of our administrative system. Finally, the third fundamental (precedents) means the same thing to America and to England—the decisions of the law courts. Here the only difference between the two countries seems to be the fact that American judges have a wider power of checking public health activities as ultra vires. Owing to the rigid written constitutions of both State and Federal Governments, the American law courts may be invoked to examine whether an Act passed for an ostensible or declared purpose is a reasonable exercise of legislative power—i.e., whether it is properly related to, and appropriate to effect, the purpose sought to be accomplished. The English observer, who knows that the Parliament at Westminster is supreme and unfettered in its sovereignty, may find it hard to understand that the public health legislation of an American State assembly can be held in check by the judiciary.

On the other hand the American observer may be surprised at one of the checks on public health administration which is presumably peculiar to England—namely, the system of disallowance and surcharge by district auditors. Section 247 of the Public Health Act of 1875 enables them to disallow any item of account which is illegal and to surcharge any deficiency or loss incurred through negligence or misconduct. This power has had a remarkable effect in restraining the ultra vires activities of local authorities and in checking corruption and illegality. The Poplar wages case, decided by the House of Lords in 1924, in effect extended the power to disallowance or surcharge where the expenditure is for a lawful purpose but is deemed by the district auditor to be excessive or unreasonable. Lord **Sumner** pictured the district auditor as a man with a duty to restrain expenditure within proper limits and with a mission to find if there is any excess over what is reasonable. Critics have remarked that the resultant situation is administratively unfortunate. Mr. W. A. **Robson**, for instance, in his recent study of "The Development of Local Government," complains that district auditors have been appointed without any practical experience of local government. Their outlook, he says, appears to be excessively narrow and lacking in vision. "The type of man who regards it as improper for a great local education authority like the London County Council to provide necessitous school-children with fruit, cod-liver oil and malt extract under the Education (Provision of Meals) Act, does not possess the mental equipment likely to produce the most satisfactory method of audit."

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[1] The Fundamentals of Public Health Law. By James E. Bauman, assistant director, Ohio State Department of Health; member of the Columbus (Ohio) Bar. U.S. Public Health Reports. March 20th. Pp. 631.

THE TREATMENT OF TETANUS.

In few diseases is prevention so simple and so desirable as it is in tetanus. But the comparative rarity of the infection—at least in some parts of the country—makes it all too easy to neglect the prophylactic use of antitoxin. The incidence of avoidable cases has lately been causing concern in France, and, as our Paris correspondent has related,[1] a committee has been set up to define the circumstances under which specific prophylaxis should be undertaken. The report of this committee will be welcome, but there are many cases in which the original injury does not come under medical supervision in time for preventive measures. Commonly the history is of some apparently trivial wound, such as an infected blister, which is treated by the patient himself until symptoms of tetanus begin. Sometimes, again, there has been no discovered port of entry for the infection, or mild tetanus has developed in spite of antitoxin. Taking all these together, cases are still sufficiently frequent—especially in agricultural districts—for the problem of actual treatment to be a very real one.

Such treatment may be directed along three lines: it may aim at neutralising the toxin, at preventing further absorption by dealing with the source of infection, or at stopping spasms and maintaining strength. As regards the first there has so far been no very general agreement about the dose of antitoxin to give. The fact that the toxin probably reaches the central nervous system by the perineural lymphatics and becomes fixed to the nerve-cells has led to the belief that it is not much use to inject serum once the disease has developed. Of the various possible routes, the intrathecal has seemed the most appropriate, and the number of units given in this way has been necessarily limited by the bulk of the remedy. During the past year, however, there have been several reports which suggest that very large doses of antitoxin, for the most part intravenous and intramuscular, are more effective. Administration of these doses has been facilitated by the greater concentration of antitoxin in the sera now available. C. S. Sherrington showed in 1917 that antitoxin in suitable quantity would protect monkeys in which the tetanus was artificially produced by injection of toxin, and A. E. Paterson[2] in Australia has attempted to apply these results in the treatment of human tetanus by using massive doses corresponding to those employed by Sherrington. In a series of 26 consecutive cases he has had 19 recoveries. The dosage used was considerably larger than any previously given. At the outset he injected 100,000 U.S.A. units intravenously and 40,000 intramuscularly, and he repeated the former injection every 12 hours and the latter every four hours until the clinical condition was much improved. In some of his cases the total number of units injected approached 2 million. M. H. Manson,[3] in America, agrees in attributing failure of treatment to late administration of antitoxin and inadequate dosage. While all routes may be used, he regards the intravenous as the most important. An adult, he says, should be given at least 100,000 units in the first 24 hours and not less than 300,000 altogether.

This week, at p. 1075, we publish an account of an attempt to neutralise toxin by intrathecal injection of carbolic acid. This treatment is based on the observation that carbolic acid destroys tetanus toxin in vitro, and that carbolic acid plus toxin will protect guinea-pigs. A solution of 1 in 400 was found to be the strongest which would not cause cellular damage, and solutions of this strength were used intrathecally with apparent success, 10 out of 14 cases recovering. Carbolic acid has advantages over antitoxin in that only one or two injections have to be given and it is not expensive. The only obvious disadvantage is its liability to damage the kidneys. As yet however both massive dosage and carbolic treatment are no more than on trial; the assessment of results is notably difficult in tetanus because prognosis is uncertain in any given case, and the results of treatment correspondingly doubtful. W. W. C. Topley and G. S. Wilson[4] have suggested that the apparent discrepancy between Sherrington's results and those obtained by clinicians may be due to the fact that the former was treating a disease produced by a measured dose of a toxin, while the latter are trying to neutralise toxin which is continually being given out by virulent bacteria in a wound. If this is a correct explanation the thorough cleansing of any infected wound at the earliest possible moment, even though the disease has developed, assumes a very important place in treatment. Hitherto much interference with the local lesion has been deprecated.

FLORENCE NIGHTINGALE.

Tuesday last was the birthday of Florence Nightingale, who would have been 111 years old, and whose long life extended almost to the outbreak of the Great War. It is not necessary to say more of her splendid work than to endorse the appeal, made in the *Times* by Dame Sarah Swift, to all who revere Florence Nightingale's memory, that they should rally to the support of the British Red Cross Society which has selected her birthday for an Empire celebration. The significance of what she did for humanity is so identified in all minds with her achievements—humanitarian, administrative, and scientific—in the Crimea, that it is inevitable to regard the pattern of nursing, which was the outcome of these endeavours and accomplishments, as the complete story of nursing—a story having its first chapter written in Scutari and owing its sequels to extensions and variations of an original text. It is not doing honour to one of the greatest women whom this country, or indeed the world, has seen to regard the profession of nurse from this point of view; and here FLORENCE NIGHTINGALE, with her large and liberal education, and profound religious convictions, would have been quick to agree.

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[1] The Lancet, March 7th, p. 540, and May 9th, p. 1049.

[2] Med. Jour. of Australia, 1930, i., 832.

[3] Minnesota Med., Feb., 1931, p. 112.

[4] Principles of Bacteriology and Immunology, London, 1930.

It was the teaching of Jesus which led to the voluntary ministrations of Christian women nearly 2000 years ago among the suffering poor, and this FLORENCE NIGHTINGALE'S preparatory work at home was designed to follow. On those early deaconesses the practice of the charity that is Love was enjoined by the Great Teacher. This work of the Primitive Church, in a more organised form, fell to be discharged by the religious Orders, and when at the Reformation a great part of the civilised world repudiated the authority of the Roman Catholic Church, secular schemes to replace the work of the Orders came into being. The duties of the nurses were then divorced in Protestant countries from religious inspiration and became largely domestic. The sad position to which the service of nursing, whether definitely associated with religious practice or rendered as domestic duty, had fallen as recently as 100 years ago became obvious to all who thought on such matters when the rise of scientific knowledge made the fundamental doctrines of hygiene common property among the intelligent. The supreme merit of FLORENCE NIGHTINGALE'S work lies in the fact that she, and in the first instance she alone in the world, perceived three things and perceived them as component parts of one ideal. She realised the need for a deep vocational call as clearly as any deaconess of the early church would have done; but she saw that this spirit of charity needed for its practical expression a measure of scientific training; and, thirdly, she learnt at the outset that the nurse, thinking rightly and rightly equipped, should form a unit in an organised scheme, under which results would be produced immeasurably larger than the sum of individual efforts. And just as FLORENCE NIGHTINGALE knew that nursing as she found it, when her great call came, needed above all things the information of modern science, so to-day would she know that, while the principles which she instilled remain fundamentally sound, the actual methods of training nurses must be perpetually modified by the growth of wisdom, by the lessons of science, general and special, and, above all, by the changes in social laws and customs inevitable upon the progress of civilisation.

ANNOTATIONS

THE DRUGS OF ADDICTION.

HEROIN has acquired the evil distinction of being the worst-known drug of addiction. The general clinical opinion in this country is that its pharmacological action is distinct from that of morphine, and that therefore it is indispensable for medicinal use. This conclusion is of considerable practical importance, because the medicinal use of heroin renders its suppression as a drug of addiction very much more difficult. Few comparative studies have been made of the pharmacological actions of heroin and morphine, and for this reason a paper recently published by two members of the U.S. Public Health Service[1] is of particular interest. These authors have studied the action of morphine, heroin, and codeine on the rhesus monkey. They first measured the minimal lethal doses. All three drugs produced death from coma and respiratory failure, but heroin was found to be at least ten times as toxic as the other two drugs, the approximate minimal lethal doses in milligrammes per kilo body-weight being: morphine sulphate 100 (85); heroin hydrochloride, 7 (1·6); codeine phosphate, 80. (The figures in parentheses show the smallest dose that produced death.) These quantities are much greater than the corresponding human doses, for 1 mg. per kilo corresponds to an adult dose of gr. 1. But since the usual therapeutic dose of heroin is at least one-third that of morphine, and these results suggest that the difference between their toxicities is considerably greater, it would appear that heroin is employed with a considerably smaller margin of safety than is morphine, and for this reason has earned its reputation of being very reliable in its action in relieving pain and cough. The same authors also examined the power of morphine, heroin, and codeine to produce addiction, by giving them to the macaques in increasing doses for prolonged periods. Well-marked tolerance was produced for all three drugs, although they all caused considerable impairment of health. Addiction was measured by periodically withdrawing the drug and noting the symptoms produced. Morphine produced withdrawal symptoms after about four months, and after a year withdrawal caused collapse associated with a fall of temperature of several degrees; in one case death resulted. The charts and photographs given in the report provide clear evidence of the physical nature of the reaction produced by withdrawing morphine from an addict. Heroin produced addiction more slowly than did morphine, for withdrawal symptoms did not occur until the drug had been given for a year. This difference may have been due to the fact that the doses of heroin were only one-tenth as great as the doses of morphine. Codeine never produced any symptoms of withdrawal. Heroin, morphine, and codeine produced cross tolerance; in the case of heroin and morphine one drug relieved the symptoms produced by withdrawal of the other, but codeine produced no relief of the symptoms caused by withdrawal of morphine or heroin. The experimental evidence therefore confirms the clinical belief that codeine is not a drug of addiction.

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[1] Kolb, K., and DuMez, A. G.: Public Health Reports, U.S. Public Health Service, 1931, xlvi., 698.

THE EPIDERMIS AND ULTRA-VIOLET RADIATION.

The permeability of human skin to ultra-violet rays has been investigated at the Lister Institute by N. S. Lucas,[1] who has repeated some old observations of Hasselbach, using a somewhat similar method and correcting for various sources of error. Since the layers immediately under the epidermis are vascular, Lucas experimented with epidermis, which was obtained from the front of the forearm by blistering. The source of light used was a Hewettic quartz mercury-vapour lamp, which, of course, does not give the same restricted range of wave-length as the sun does. Owing to the presence of a small proportion of ozone in the earth's troposphere all rays of a shorter wave-length than 3300 A (Angstrom units) are filtered out, being cut off completely at 2850 A. Lucas studied the transmission of waves from 4370 to 2560 A and found that the longer waves were almost completely transmitted. He says, referring to what he considers his most representative experiment: It appears then that in the range of wave-lengths of the sun's light arriving at the earth's surface which are active in the cure of rickets amounts varying from 55 per cent. for wave-length 313 $\mu\mu$ (=3130 A) to 26 per cent. for wave-length 294 $\mu\mu$ (=2940 A) may be transmitted to the dermal capillaries.[2] He concludes that the apparent absorption of ultra-violet light by epidermis as determined by the usual methods of photometry is not entirely true absorption, but is in part a scattering of incident light by the epidermis which is not optically homogeneous. This scattering causes much less loss of transmission in vivo than under experimental conditions, and is dwarfed by true absorption for short waves of 3000 A or less. The curves of absorption, he remarks, are very similar to those of many proteins and amino-acids. His values are very much higher than those found by Hasselbach. It appears from this work that the clean epidermis is a fairly good transmitter of those beneficial ultra-violet rays which fall upon it and is selective against the shorter rays which are not found in the solar emission as we receive it, but are present in unscreened artificial ultra-violet light.

CAUSES OF DEATH AMONG DOCTORS.

From time to time the *Journal* of the American Medical Association analyses the records of deaths of physicians published in its columns, and the latest group is made up of 2943 which occurred in 1930.[3] Although these records may err through missing some members of the profession who died young, it is interesting to compare them with our own occupational data[4] which deal with all medical practitioners who died in this country during 1921–23 and include 1578 deaths. In the United States the average age at death was 63·7 years; in England it was just below 63 In the States 4·4 per cent. of deaths were due to accidents (half being motor-car accidents), and in England 3·7; in the States 2 per cent. were due to suicide, and in England 2·2 per cent; in the States 1·3 per cent. were due to cirrhosis of the liver, and in England 1·4 per cent. In both countries heart disease claimed most deaths. Next in order followed, for the States, cerebral hæmorrhage, pneumonia, nephritis, cancer, and arterio-sclerosis; and for England, cancer, pneumonia, cerebral hæmorrhage, arterio-sclerosis, and nephritis. It is significant that, although the order is slightly different, the same seven great causes of death for both groups claim most victims. In the absence of any census of physicians in America, no death-rates can be calculated. But our own records, which give mortality-rates comparable with the general standard, show the death-rates which are unduly high to be those of suicide, cirrhosis of the liver, accidents, digestive diseases, appendicitis, and pneumonia, in the order given. The medical profession shares several of these high rates with other professions; but pneumonia and accidents seem to present special risks for the doctor, which is easily explained by the conditions of his calling.

SALE OF PROPRIETARY MEDICINES IN U.S.A.

We have read with sympathetic interest the details of a proposed plan for the control of the sale of proprietary remedies in New York. The author of the scheme is Dr. Samuel M. Gordon, secretary of the council on dental therapeutics of the American Dental Association, who was invited by the Commissioner of Health of New York to make a survey of the present drug administration of that city and offer suggestions how to bring its activities into line with present-day notions. The sale of proprietary medicines in the United States is already subject to control; the operation of the Pure Food and Drugs Acts and the special regulations adopted in various States suffice to prevent many of the practices which are common enough in this country. Nevertheless, American legislation has not sufficed to suppress the evil, and although the heyday of the business seems to be past in the United States and the old method of advertising may have been suppressed, "it has been replaced," says Dr. Gordon "by a more subtle and more insidious exploitation of articles for various groups of ill-defined conditions, based on an evasive appeal to the health desires of the public . . . . Patent medicines are exploited by means of subtly written advertisements in such manner that the uncritical and none too careful reader is allowed to read into general, and, as a rule misleading statements, that he or she is suffering from diseases or conditions for which a patent medicine in question possesses curative properties." The cunningly worded devices do not contravene the law, although they are obviously contrary to its spirit. What has happened is that the Drugs Acts having made the "lie direct" a penal offence it has become necessary for medicine-mongers to resort to "the lie by inference." It is the desire of the New York Health Department to outwit the users of the "lawful" form of falsehood, and it is thought that this could be accomplished by putting Dr. Gordon's scheme into operation.

Most of us know the dexterous member of the family who tells us without looking at it which particular card "you hold in your hand." The trick depends upon the conjuror's ability to make us pick the card he intends us to pick. Dr. Gordon writes:—

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[1] Biochem. Jour., 1931, xxv., 1, 56.

[2] The author here uses $\mu\mu$ as in Germany to denote a thousand millionth of a metre. In the United States of America $\mu\mu$ denotes a million millionth of a metre. The ambiguity is a strong plea for the universal adoption of the Angstrom unit or "tenth metre," the equivalents of which we have added.

[3] Jour. Amer. Med. Assoc., April 11th, p. 1230.

[4] Occupational Mortality. Registrar-General's Decennial Supplement. England and Wales. 1921. H.M. Stationery Office. 1927.

> To-day advertising has invested itself with a psychological basis intended to make people purchase something for which there is no intrinsic need. It does not appeal to real needs, but it appeals to desires stimulated by the wording of advertising. When applied to clothing, automobiles, radio, and the like, the loss is merely an economic one. Where applied to patent medicines the aim is to make well people believe they are sick, and sick people believe they are very sick. A stimulation mentally to force the purchase of a patent medicine is thus brought about by adroitly worded advertising in newspapers . . . . Consequently this is not merely an economic waste but presents an actual menace to the physical and mental well-being of the country.

The morality of salesmanship which aims at inducing people to buy something they do not want and cannot afford to pay for has often been argued. It would, however, require a good deal of special pleading to whitewash the salesman or the copy-writer who, for the sole purpose of gain, succeeds in making some deluded person buy a cure for cancer or a pill to rejuvenate the arteries. Dr. Gordon's method would be to put such a person in gaol. The case as put by him furnishes convincing evidence of the need of further action to protect the fool from his folly. One difficulty lies in the fact that even people of culture are among the victims from the nostrum-monger and a considerable proportion of his earnings comes from the pockets of learned ignoramuses. If, then, in spite of all their enlightenment some apostles of culture are not averse from swallowing rubbish in the guise of nostrums, what is to be done to get down to the masses? Dr. Gordon believes in specialised education. He would invite the citizens of New York to write to the Health Department for information and advice on specific medicines in which they are interested. He would set up what he calls a rogues gallery. He would invite newspaper proprietors to submit advertisements of patent medicines to the Department before publication and to undertake to require advertisers to confine statements to the recommendations of the Board of Health, and his plan for dealing with those publications "which show a tendency to subvert the public health interest to financial returns" is to make them see light by a carefully planned educational campaign through the medium of other papers which are willing to follow the Department in their campaign for honesty and decency in medical advertising to the public. If the experiment is tried, as we hope it will be, the results will be examined with interest here.

A SEROLOGICAL TEST FOR CANCER.

Dr. Bendien's book,[1] which has been having much publicity in the daily press, proves on examination to be a soberly written, highly technical dissertation on the physico-chemical state of the proteins of the blood-serum. The investigations are based on a flocculation reaction which occurs when a solution containing mixtures of sodium vanadate and acetic acid in slightly varying proportions is added to the serum. Twenty different solutions of these sodium vanadate and acetic acid mixtures are placed in test-tubes containing equal amounts of normal human serum. Flocculation begins in the tube containing mixture No 6, rises to a maximum in mixtures 14 and 15, and then diminishes until the end of the series when it disappears in No. 20. The various factors which might affect this reaction have been studied in great detail—for example, viscosity, sedimentation of red corpuscles, and relation of globulin to albumin. One point to which Bendien attaches importance is the change produced in the reaction, if the serum has been inactivated previously by heating to 56° C. for half an hour. The flocculation then does not begin in mixture 6, but only in mixture 7. In a number of pathological conditions this shift of the flocculation reaction is reversed after heating the serum—that is to say, the reaction develops before mixture No. 6. From all these considerations Bendien arrives at the conclusion that in certain pathological conditions a new type of protein appears in the serum. That this is true is confirmed, he thinks, by the finding that in different diseases the flocculated material gives different and characteristic pictures on spectro-photometric examination. If the change in the reaction occurs regularly in the serum of patients suffering from cancer, especially in the early stages, it should form the basis of the long-sought serological test. On this point Bendien states that flocculation below mixture 6 indicates the presence of cancer or tuberculosis. He even believes that a disposition to these diseases finds expression in a shift of the flocculation reaction which differs for the two diseases. But the evidence he submits on this aspect of the problem is disappointing. There are now on record quite a number of serological reactions in which the serum of cancer patients shows differences from that of normal persons. But since similar differences are exhibited by serum from patients suffering from other diseases the diagnostic and even the theoretical value of these reactions is small. The material submitted by Dr. Bendien to test the diagnostic value of his reaction is, as he himself admits, not very extensive, and he is careful to point out that the subject requires further study. So far as it goes there is little evidence that the reaction is clinically specific for cancer.

FIRST-AID ON THE ROADS.

APPROPRIATELY enough for Safety Week in this country, Mr. Pierre de Bernonville, secretary of the Standing International Commission for First Aid on Highways, gives an account[1] of the rapid evolution of first-aid on the roads during the last few years. It is satisfactory to note in his international review that the first country to organise this work systematically was Great Britain. Some ten years ago the British Red Cross Society and the Order of St. John of Jerusalem set up a high-road service, using motor ambulances from their war stock. A little later, Germany, Belgium, France, and Switzerland took similar steps. Other countries to follow were South Africa, Italy, the United States, and, more recently, Denmark, Holland, Norway, Persia, Poland, Siam, and Sweden. In March, 1930, the Central International Touring Board, which is the supreme authority of the touring organisations, and comprises the Automobile Club and the Touring Club groups, pronounced in favour of a policy of coöperation between all bodies interested in the organisation of first-aid posts on highways. The Board and the Red Cross quickly established satisfactory working relations, and the matter was placed on the agenda of the Fourteenth International Red Cross Conference in Brussels. Here it was agreed to constitute a standing commission to assure uniformity of action; the first meeting of this *Commission Internationale*

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[1] Specifische Veränderungen des Blutserums. Ein Beitrag zur serologischen Diagnose von Krebs und Tuberkulose. By S. G. T. Bendien (Serological Laboratory, Zeist, Holland). Jena: Gustav Fischer. 1931. Pp. 99. M.5.50.

[1] Review and Information Bulletin of the League of Red Cross Societies, May, 1931.

ermanente de Secours sur Route was held at the ffices of the League of Red Cross Societies in Paris st November, and at its second meeting in February ethods of establishing satisfactory collaboration etween the Red Cross and tourist bodies were tudied, as was also the problem of first-aid posts t points where roads cross frontiers. The next eeting of the Commission will be held in November. Ir. de Bernonville's paper concludes with a statistical nalysis of the mortality-rates from road accidents er 100,000 in various countries. While this rate is 9·5 for the U.S.A., it is only 8·4 in England and Vales, and as low as 2·1 in Norway.

THE DIFFICULT CHILD.

THERE always have been difficult children, but he "problem child," as the unfortunate youngster s sometimes called, has come to occupy a prominent lace in the public eye only of recent years. This nay be at least partly due to the fact that in the days f unrestricted families children very largely brought ach other up, and on the whole did not do their work oo badly. Now that families consist of ones and wos, and even the moderate-sized family is so spaced ut that every child is almost an only child, the ttention of adults is heavily focused on the young, nd their interaction is very probably bad for both. Among many recent discussions of this subject were ix lectures delivered under the auspices of the Jewish Health Organisation at Toynbee Hall last ummer. They were published in *Mother and Child* and are now reprinted as a pamphlet, in the pages of which everyone interested in the difficult child will ind food for thought.[1] Dr. Emanuel Miller deals with the general characteristics and history of the problem child and with the rôle of the psychiatrist and the coördination of social, psychological, and medical factors in his treatment. Dr. Noel Burke describes the management of a child-guidance clinic, and the physical factors in the child's make-up. Miss Beatrice Robinson discusses the functions of the social worker, and Mr. M. Fortes the intellectual endowment of the difficult child, who is by no means usually defective in brains. It is an essential feature of the child-guidance system, imported from America, that the child is studied by a team of whom only one or perhaps two members are medical. This has many advantages, not the least of which is that stressed by Dr. Miller when he says that the case conference exists psychologically in order, that those concerned in the case should understand one another; that, for instance, the psychiatrist should meet the teacher and discover whether the problem is a function of the teacher's personality, and that the teacher in turn should tell the psychiatrist frankly if she thinks that he is manufacturing a case. The system also enables the psychiatrist to deal with a very much larger number of cases than would be possible if he had to undertake the necessary research himself. It has, however, one peculiar feature which may prove of great importance and to which more attention should perhaps be directed than has been done so far. This is that the home has been made peculiarly the province of the social worker. The psychiatrist himself never sees the home and does not always see the parents. Yet it is a truism to say that the parent is the principal factor in the genesis of the difficult child. It is also a truism to say that the parent is the most difficult part of the child's environment, both for the child and for the psychotherapist. It is certainly true that in many cases some simple misunderstanding or maladjustment can be explained by a gifted social worker to an intelligent and coöperative parent. An alteration, for instance, in the child's diet or punishments or working hours may produce the desired result. There is also a large number of cases where the parents are not intelligent or coöperative, and these can be dealt with as effectively by the social worker as by anybody. It may be necessary to dismiss them as hopeless and to remove the child from them, or they may be amenable to lengthy, patient, tactful persuasion such as she, better than anyone else, knows how to apply. But all too often the child's neurosis is its reaction to a genuine psychological failure on the part of the parent, and is concerned with just that problem over which its parents have stumbled or from which they have turned away. In these cases the only genuine treatment for the child is psychological treatment of the parent; anything else is merely patching. Is the medical profession wise in tacitly allowing this type of case to be handled by the social worker? It may be argued, indeed, that only the skilled psychotherapist himself can determine which case falls into this class, and it is certainly true that no more delicate and difficult task confronts him anywhere than the task of laying bare to one or both parents the real secret of their child's misbehaviour when that secret is their own most tender spot. The problem of the parent has not been wholly solved by the child guidance scheme.

A COSMETIC QUESTIONAIRE.

THE treatment of hypertrichosis has been made the subject of continental inquiry.[1] The great majority of authorities are emphatic in their condemnation of X rays for this purpose, a notable exception being Dr. Guido Holzknecht, who holds the chair of medical radiology in Vienna, and whose unrivalled experience entitles his opinions to respect. He believes that X ray treatment has its place in selected cases, provided that the risk is realised and technique is faultless. He would base his selection on the degree and localisation of growth, the character of the skin, and the patient's age. He would not apply X rays to lanugo hairs, to sporadic single strong and coarse hairs, to symmetrical moustache hairs, or to hair on the parotid area. The skin over the extremities he regards as more sensitive to X rays than that of the face; persons with a delicate complexion are more liable to injury than those with a thick sebaceous type of integument. He would allow a period of months to elapse between each epilation, the total of which should not exceed five. The existence of a controllable endocrine factor should be borne in mind, and search made for ovarian or suprarenal dysfunction. In no case would he promise a cure, any more than in eczema or tuberculosis. F. Juliusberg thinks well of a combination of X rays with thallium acetate by the mouth, as already used with success for temporary epilation in tinea tonsurans. At present he relies chiefly on the time-honoured electrolysis or the more recent destruction of the hair follicle by instantaneous electro-coagulation. Drawbacks to these are the waste of time, the expense, and the considerable chance of recurrences. It is not a good method when the hairs are close together on account of the risk of scarring.

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[1] Obtainable from the Secretary of the Organisation, 19, Dorset-square, N.W.1; price 1s.

[1] Dermatologische Wochenschrift, April 4th.

The pumice-stone treatment demands great patience to avoid irritating the skin; it has its use over large areas, and if persisted in for years undoubtedly promotes permanent atrophy of the follicle. Chemical depilation with barium and strontium salts also brings the danger of irritation, and sufferers would be wise to prefer extraction with the epilation forceps for isolated hairs, or the safety razor. The new electric clippers, set at 1/10 mm., give safe if imperfect results. E. Langer (Berlin) condemns X rays and gives the following detailed directions for the use of pumice-stone. After a preliminary shave (the upper lip is the main indication), 5–20 per cent. pernatrol soap (H_2O_2) is applied daily for 5–10 minutes and well lathered; a smooth piece of pumice-stone is then gently rubbed over the hirsute area for about the same time. The treatment must be intermitted on the slightest occurrence of irritation. Infection is prevented by the application of eau de cologne along with a non-greasy cream and powder. G. Nobl (Vienna) prefers electrocoagulation to electrolysis, because its effect is limited to the point of the needle and does not extend along the shaft. He condemns X rays, as also does Prof. H. T. Schreus (Düsseldorf), who states that the removal of cosmetic stigmata has been sometimes more than offset by the production of hoarseness from injury to the larynx, by xerostoma from damage to the parotid, and even by epithelioma. P. Unna, jr. (Hamburg), agrees with Nobl on the advantages of electrocoagulation, but he uses X rays according to Holzknecht's technique in very pronounced cases to weaken the growth of hair when a combination of other methods is used to achieve the final result.

SURGERY IN ANIMALS.

IN his oration before the Medical Society of London, reported on another page, Sir John Rose Bradford spoke wisely of the lessons to be learnt from comparative medicine. Many of the leaders of our profession have sought such inspiration in the past and have found in the solution of problems by animals a help to similar conundrums in man. Surgeons will therefore, we think, find a perusal of the March issue of the *Veterinary Journal*, a special surgical number, of more than ordinary interest. They will meet here a group of men engaged on similar work to their own and tackling it in the same way, but with particular problems and difficulties inherent in the nature of their patients.

Man has developed a fraternal interest in the beasts which serve him, that prompts him to prevent any suffering that can be avoided, and to alleviate it when it appears. The easiest way to end animal suffering is to kill the diseased and the injured; curative treatment, which may be lengthy and in some cases expensive, is primarily undertaken not for the benefit of the patient but of its owner. Most veterinary operations are done either to overcome some disability interfering with the usefulness or earning capacity of the animal as a servant, or in the case of pedigree stock, to preserve it for stud purposes. Castration is a familiar example of the first class of operation, done in creatures ranging from cats to cattle, to render them more docile, and in birds to increase their weight. Sporting animals suffer from many common disabilities for which surgical aid is sought. Roaring, due to paralysis of one vocal cord, usually the left, renders a horse, otherwise perfectly sound, unfit for hunting or racing. Tracheotomy has been carried out for years to overcome this disability, but has the disadvantage of unsightly appearance and the need of frequent dressing; more recently the ventricle-stripping operation, advocated in this country by F. T. G. Hobday, has largely replaced the older method. Dogs have, till lately, come under the veterinary surgeon chiefly as household pets. Being bred over centuries under conditions remote from those under which their ancestors were evolved, living in circumstances of food and housing not differing greatly from those of their masters, and surviving often far beyond the physiological old age of an animal under natural surroundings, they suffer from many of the diseases to which human beings are liable. For this reason, and because of affection of their owners, canine surgery includes many of the procedures common in the hospitals of man. Dentures and spectacles have even been supplied to make good the losses of old age. Greyhound racing, moreover, has brought the dog that may win large sums for its owner, and has created the science of canine orthopædics.

Fractures are common in animals, especially in horses used for hunting and racing, and in dogs, when they are usually the result of a motor accident. In the larger quadrupeds the difficulty of reducing and splinting one of the limb bones is almost insuperable, and the animals are afterwards useless except for stud purposes. They are usually shot, though plating may be attempted in valuable horses. Fractures of the maxilla are, however, treated by wiring. Dogs are much more amenable patients and their fractures are treated by splints, of wood or plaster, with satisfactory results, a small degree of lameness detracting little from the animal's usefulness. Fractures in birds are treated with gum bandages.

The interest of surgeons in veterinary work is often of a more direct kind. Operative surgery is never taught in this country as it is in America, by instruction in operating upon animals, but surgical research in many of its branches demands animal experiments, and the research department of a modern hospital is a counterpart in miniature of a veterinary hospital. On the whole the conditions which govern animal surgery bear a striking resemblance to those under which we work. The majority of our instruments have their counterpart in the veterinary theatre, but those used on the larger animals are naturally modified greatly to obtain increased power. The theatre is similar in lighting and cleanliness; the operating table is a surgical one in miniature, for it is only used for small animals. The larger ones are operated upon either standing or lying according to the anæsthetic. Anæsthesia is produced by the recognised methods. Chloroform and ether are used for inhalation, avertin for rectal anæsthesia, and novocain or the ethyl chloride spray for local anæsthesia. Spinal anæsthetics have little application in animal surgery. Depilation is a more difficult problem in animals than in man; in some the razor is used, but it is more common to apply a depilatory paste of 25 per cent. barium sulphide, left on for five minutes. It is fortunate that dumb creatures do not suffer from pre-operative anxiety. The operation itself is conducted along lines that are familiar. The sutures and ligature materials are those used by surgeons, but, owing to the nature of the operation performed, many of the procedures may be strange. The abdomen is commonly opened by a longitudinal incision, but in experiments on cats it has been stated that transverse incisions heal with less trouble, and it would be interesting to know whether any veterinary surgeons have had a similar experience. A writer in the *Veterinary Journal* employs MacBurney's incision for ovariotomy in a mare. The commonest of our abdominal operations, for appendicitis, peptic ulceration, and gall-stones, do not appear to be in demand, but strangulated inguinal hernia occurs in dogs. Intestinal obstruction from enteroliths or swallowed foreign bodies takes proportionately a much more important place, and is treated by enterostomy, or in late cases, by resection. End-to-end suture of the intestines of dogs and cats is found to be unsatisfactory owing to the small lumen and thick walls of the gut, and lateral anastomosis is preferred. Pyometra is common in bitches, demanding hysterectomy.

It is in post-operative treatment that the difference between human and veterinary surgery becomes more apparent. Animals, with the exception of race horses and some highly bred dogs, are of hardy stock; they do not suffer from surgical shock unless the operation has been exceptionally severe, and their tissues heal well. But the patient must be returned to a kennel or stall, which, however cleanly, is far from sterile. Dressings may be applied but are never left alone, and in most cases are soon licked or bitten off; rest to the injured part is extremely imperfect. In this respect dogs and cats, when their confidence has been gained, make the best patients. But in general the veterinary surgeon has to rely on antisepsis rather than asepsis during the post-operative period, and while serious infection is rare so is primary union.

SEDIMENTATION-RATE IN TUBERCULOUS CHILDREN.

SINCE a department for tuberculous children was opened at the new St. Johannes Hospital in Budapest Dr. L. von Csöke has investigated[1] the sedimentation-rate of the red blood corpuscles for nearly every patient admitted. The method of Westergren was used throughout and the results standardised for the degree of sinking observed in an hour according to the accepted formula. Altogether 329 children were investigated with more than 1000 total sedimentation-rate determinations. A large proportion of these children suffered from tuberculosis of the bronchial lymphatic glands, a condition in which signs and symptoms are scanty and it is often difficult to establish whether the disease is active or latent. Dr. Csöke considers that the border-line value for the sedimentation-time in such cases is 12 mm. Over this value were 108 cases of active bronchial gland tuberculosis with an average rate of 18 mm., while 52 cases with latent disease showed an average rate of 10 mm. This is in accord with previous observations by Rókay, who considered rates of over 13 mm. in fever-free cases as in favour of active disease in the glands. The sedimentation-rate in six cases of what he calls "epituberculous infiltration" also gave an average of 18 mm., but the association with bronchial gland involvement with this condition made it difficult to draw deductions. The results for pulmonary tuberculosis in children followed much the same lines as those already established for adults in numerous centres. With fibrotic cases an average of 40 mm. was obtained, while for more acute exudative cases the average rate was 100 mm. Four cases of miliary tuberculosis gave rise to some difficulty because the values varied from 6 to 80 mm., and it is known that in moribund cases the sedimentation-rate may closely approach the normal. In order to obtain more help from the sedimentation-rate in distinguishing between cases with good and bad prognosis Dr. Csöke carried out a series of investigations in which the rate for each quarter of an hour was noted. The results obtained for 52 children could be divided into three groups. In the first the maximum degree of sedimentation was observed in the first half-hour and was an indication of a serious degree of disease. The second group comprised those cases where the maximum degree of sedimentation occurred in the second half hour; here the clinical features were slight and the prognosis good. In the third group sedimentation-rate was nearly regular for each 15-minute period in the hour; this occurred in the terminal stages of the disease, being also a feature of physiological sedimentation. The value of this differentiation can be made clearer by an example. If a child is found, for instance, to have a sedimentation-rate of 25 mm. it is possible from a consideration of whether the rate is maximum in the first or second half of the experimental period to say that the disease process is serious or slight respectively. Very high values for the sedimentation-rates were obtained in 18 cases of surgical tuberculosis; the highest rate of the present series was in a child with extensive spinal caries who gave a rate of 192 mm. It was observed that the sedimentation-rate in three cases of bone and joint tuberculosis was closely associated with the presence of intercurrent complications, and indeed could be taken as a very early indication of their being present, for example, weeks before clinical evidence of abscess formation. Dr. Csöke discusses, in light of his own and others' results, some of the theoretical aspects of the sedimentation-rate, but he is unable to come to any definite conclusion as to the exact mechanism. He points out however that in children the physiological values are higher than in adults, and that before the age of 10 years the sex differences, well recognised in adults, are not so pronounced.

THE next session of the General Medical Council will commence at 2 P.M. on Tuesday, June 2nd, under the Presidency of Sir Donald MacAlister.

WE regret to announce the death of Dr. Thomas Robinson Glynn, for 40 years professor of medicine in the University of Liverpool. He died on May 12th at St. Asaph at the age of 90.

LONDON HOSPITAL MEDICAL COLLEGE.—Lord Macmillan will distribute prizes and certificates to students of this College on Wednesday, June 24th.

JOINT TUBERCULOSIS COUNCIL.—A post-graduate course on tuberculosis (study tour) has been arranged by this Council to take place in Holland. Various institutions for combating tuberculosis in Holland will be visited and the methods employed will be explained. The tour will begin on June 29th and end on July 4th. There will also be a post-graduate course on tuberculosis in Lancashire from Oct. 19th to 24th.

The Council announces that Dr. Peter W. Edwards, medical superintendent of Cheshire Joint Sanatorium, near Market Drayton, Salop, has been invited to give a series of short practical courses on modern methods of treatment in tuberculosis of the respiratory system with special reference to collapse therapy. Methods of sanatorium administration will also be demonstrated. No class will exceed four members in number, and no course need last more than three days if more time cannot be spared. Arrangements for board and residence can be made within a convenient distance of the sanatorium.

Details of all these courses may be had from the hon. secretary for post-graduate courses at 8 Highway-court, Beaconsfield, Bucks.

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[1] Jahrb. f. Kinderh., April, 1931, p. 216.

SPECIAL ARTICLES

THE MECHANISM OF MICROFILARIAL PERIODICITY.

BY CLAYTON LANE, M.D. LOND.,
LIEUT.-COLONEL, I.M.S. (RETD.).

NEARLY two years ago, in writing on the difficult question of the mechanism of filarial, that is microfilarial, periodicity, I concluded as follows:—

> "If the embryos of *F. bancrofti*, when absent from the skin blood, harbour elsewhere, it is physically unthinkable that they should do so in the overwhelming current of the large blood-vessels; they accumulate in these in numbers from the lymph trunks at or after death only. Nor are they being held back from skin blood by contraction of visceral capillaries, since these can hardly close on one species and open for another circulating in the same blood at the same time. If it were their posture which maintained microfilariæ for many hours daily in deep capillaries, posturing would not be completely discarded in drawn blood. Living microfilariæ have never been found congregated by day in any deep capillaries in numbers corresponding in any way to those demanded by this hypothesis of the mechanism of periodicity; no secret retreat of theirs has been discovered. If they were long-lived, old should be distinguishable from young larvæ by visible changes induced by their activity. Periodicity, then, cannot reasonably be explained as being due to a changed distribution within the blood-vessels of long-lived microfilariæ. Moreover, such a condition holds no biological advantage for the species.
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> "The known facts have a cumulative weight in favour of the hypothesis that microfilariæ within the body perish rapidly, at least daily, and that periodicity is the result of simultaneous cyclical parturition."[1]

Fresh work reported on filariasis seems to justify a return to the matter; but first it may be stressed that the title of the paper under reference meant exactly what it said; it considered the mechanism, that is the mechanical means, by which microfilarial periodicity in the peripheral blood is produced. It seemed so obvious that the mechanism must be brought into action "by some stimulus at present unknown," and that the stimulus and mechanism were two distinct things which should be dealt with separately, that speculation as to the former was then, and is now, deliberately avoided as not being pertinent to, but as merely complicating, the point at issue. Perhaps it was by reason of such a misunderstanding that "L. E. N."[2] has dismissed filarial periodicity in these words. "Most of the theories are dependent on isolated observations and none of them appear to fit half the known facts." If that is not the case, an enumeration of that particular half of the known facts which cyclical parturition does not mechanically explain is overdue. Another point may be expanded. Sir Patrick Manson definitely attributed microfilarial periodicity to retirement, during the day, of microfilariæ from the skin principally to the large arteries and lungs. P. H. Bahr[3] dealing with a case of the non-periodic form found in just these situations 69 per cent. of embryos made visible by blood films. It can hardly be doubted that Manson would not have suggested "retirement" as an explanation of periodicity had he first had such an experience with the non-periodic form.

TWO PHYSIOLOGICAL FORMS.

Commenting on my paper Dr. P. H. Manson-Bahr[4] expressed the opinion that there was nothing unbiological in the idea that female filariæ have certain cyclical and well-developed periods for emptying the uterus of imprisoned embryos. He further stated his belief that the two physiological forms of *F. bancrofti* had different habitats—the adults of the nocturnal form appearing to live in the main lymphatic trunks in the neighbourhood of the thoracic aorta, maintaining that is a central location; whereas those of the non-periodic form inhabit the "lymphatic glands, epididymis, tunica vaginalis, and perhaps the organs of the body. *It maintains a peripheral distribution.*" Work by F. W. O'Connor, R. Golden and H. Auchincloss, already noted in THE LANCET,[5] has since lighted up this matter. X rays, they found, could be made to throw shadows of objects in the subcutaneous tissue, and excision of parts which threw the shadows showed that these latter were due to calcified filariæ; moreover, there were in these particular instances as many living shadowless filariæ as calcified shadow-throwing ones. Fifteen subcutaneous shadows were in fact detected in one limb, and the filaria was Porto Rican with nocturnal periodicity. This paper made it clear, first that adult *F. bancrofti* swarms (the word seems fair) in habitats whose search has been greatly neglected, and second that a peripheral distribution turns out to be not specially characteristic of the non-periodic form. Dr. Manson-Bahr, who has recovered 13 live filariæ from a single epitrochlear gland of the size of a pigeon's egg, further notes that from his autopsies he would not place the number of fecund and mature *F. bancrofti* present in a filariated individual at one time as being higher than 20; he calculated on that basis that 328,000 embryos would be circulating at one time for each female filaria harboured; and he noted that, if there is daily death of a cyclical brood of microfilariæ, this prodigious number must be produced daily by each female worm. But since the Porto Rican work has subsequently shown that so many worms may lie in habitats not hitherto systematically investigated, the daily birth-rate of each female must reasonably be taken as greatly below this huge number. Time has, then, shown that these difficulties in accepting cyclical parturition as the cause of filarial periodicity have not the weight they appeared at that time to possess. On the other hand, Dr. Manson-Bahr's letter offered what seems to be very definite new evidence of the short life span of microfilariæ in the body, for he wrote:

> "In pure chyluria such few observations as I have made go to show that the filarial embryos are usually dead by the time they appear in the urine; but in hæmatochyluria where there has been outpouring of the blood into the chylous urine . . . numbers of living microfilariæ appeared in the urine passed at night time."

That single observation suggests (does it not indeed imply?) that urine is not in itself deadly to microfilariæ, and that they are usually dead when they are passed in it because their life span has been exceeded by the time they reach the bladder after a slow progress through blocked lymphatics. What is the usual finding here? The point seems unremarked in print and I have no personal records. Yet it should be readily investigated, and its importance is clear in attempting to discover whether *F. bancrofti* has in the human body a life of only a few hours.

FRESH EVIDENCE OF SIMULTANEOUS CYCLICAL PARTURITION.

The argument put forward in 1929 as to the mechanism of microfilarial periodicity was, it will have been noted, essentially inferential. It consisted in the discussion of the mechanical agents by means of which various writers have attempted to explain periodicity as a redistribution of microfilariæ within the body, their rejection one by one as being mechanically unreasonable, and the conclusion that the only reasonable explanation left was simultaneous cyclical parturition by female worms; it used that process of exclusion which has so often led medical men to right diagnostic conclusions. There was little direct evidence for cyclical parturition, for Manson's prompt and widely accepted refutation of Meyer's suggestion to this effect laid the matter at rest for half a century.

But since my reopening of the subject two years ago, more direct evidence of cyclical parturition has been sought for and has, I think, been found. F. W. O'Connor[6] has reported the result of examination of a testis and cord handed over to him. It had been removed at 5 P.M. from a Porto Rican who had died apparently from 6 to 12 hours earlier. As has been mentioned, periodicity is here nocturnal. General dilatation and hypertrophy of lymphatics suggested that there had been blockage in the abdomen. In a dilated lymphatic vessel of the parietal layer of the tunica vaginalis lay a fully developed female *F. bancrofti* containing no microfilariæ but having the posterior two-thirds or more of the uterus full of eggs. This was the only worm in which calcification had not at least begun—the only living worm. Microfilariæ were not found within half an inch of this worm nor yet in the upper part of the specimen; but about an inch and a half above the worm there was a zone in which they were present in the walls of the lymphatic vessels and in the connective tissues round them, and indeed were very numerous about the equator of that zone. O'Connor concludes: "Histological studies suggest that the hypothesis of Clayton Lane, to the effect that the phenomenon of filarial periodicity is due to simultaneous cyclical parturition of the gravid female, is correct." Further, Dr. O'Connor has generously put at my disposal his notes on a more recent and as yet unpublished case. A man was shot late at night, the right testis, cord, and hydrocele being removed next day. There were a few microfilariæ in some of the blood-vessels and enormous numbers in the right hydrocele. In the tissues were discovered four fully developed gravid females. "Every stage of development of ova and microfilariæ was found in each of the worms except the final stage . . . . In the four worms the stages of development were identically the same and [the microfilariæ] would therefore, had the patient lived, been born at the same time." There was then, as O'Connor himself points out, evidence pointing towards simultaneous cyclical parturition, and it is sufficiently satisfying to warrant further work on a considerable scale on the same lines with a view to determining whether this is a normal finding in regions in which microfilarial periodicity occurs, and an abnormal one in those in which there is non-periodicity.

DESTRUCTION OF MICROFILARIÆ.

As regards the destruction of microfilariæ there is now this to add. Lymphatic filarial obstruction has hitherto been considered as explicable in terms of damage done to main lymphatic trunks, or to lymphatic glands by adult worms or by larvæ injected by mosquitoes. But the work of O'Connor and his colleagues has shown that adults may live in numbers in the smaller lymphatics of the limbs and on the distal side of all lymphatic nodes; the conditions then are such that, so long as the lymph circulation remains reasonably normal, every microfilaria from these adults must pass through the nodes concerned, and, if the fate of hookworm larvæ be any criterion, the passage will induce considerable activity in them during the process of getting rid of the embryos. Persistent passage of embryos is then likely to be followed by fibrosis and lymphatic obstruction; so that in the destruction of microfilariæ, in the removal of their dead bodies or the dissolved products of them, and in subsequent production of lymphatic obstruction, these nodes are likely to prove to play a part—if all microfilariæ die within 24 hours a very considerable one. Even in this small corner of the filarial problem there is much that will repay intensive study.

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MEDICINE AND THE LAW.

Artificial Cream.

THE Artificial Cream Act of 1929, which began life as the Reconstituted Cream Bill, has shown that hasty and unofficial legislation encounters perils in draftsmanship. Its origin is well known. The dairying industry, hard hit by restrictions on the use of preservatives, found itself fighting two new commercial competitors. One was synthetic cream, derived from vegetable fats and easily distinguishable from raw cream on analysis. The other, called "reconstituted cream" though in fact it had never been cream, was a substance made from butter-fat, milk powder, and water and thus contained elements actually derived from the cow. Agricultural interests in England would have preferred that Parliament should absolutely forbid the use of the word "cream" except in relation to genuine dairy cream. The Artificial Cream Act, however, when it emerged after copious amendment as a valid statute, was not so drastic. The Act defines "cream" and "artificial cream." Its principal provision enacts that nobody shall sell "under a description or designation including the word 'cream' any substance *purporting to be cream* or artificial cream as defined in this Act unless (*a*) the substance is cream as defined in this Act, or (*b*) where the substance is artificial cream as defined in this Act, the word 'cream' is immediately preceded by the word 'artificial.'" Commenting on the words "purporting to be cream," which we have italicised above, the editor of Bell's "Sale of Food and Drugs" observed that the enactment does not apparently apply to articles of food like cream buns which do not "purport to be" cream, though they may be thought to contain it. His observation has been proved correct by the King's Bench Division on the appeal of J. Lyons and Co. from a decision of the Swindon justices.

A county council inspector in Wiltshire bought something labelled "Lyons' Swiss Rolls, Chocolate Sponge (Cream Filled)." There was also a purchase of "Lyons' Cream Sandwich (Vanilla Filled)." The justices thought these articles of food were sold as containing cream; they held that they did not contain cream but a cream-like substance (perfectly wholesome) made of an emulsion of fat from vegetable oil and not derived from cream or milk. The justices convicted but the High Court sent the case back to them for their decision whether the articles sold were sold as "purporting to be" cream. The justices, at a further hearing, decided in the affirmative and imposed a conviction. The King's Bench Division has now allowed the appeal of the confectioners. As Lord Hewart says, the Act uses the words "purporting to be cream," not "purporting to contain cream." It may be that the statute was meant to cover composite articles of food such as cream sandwiches, but the statute does not say so. If there is a gap, the gap must be filled by the legislature not by the law courts. As it now stands, the Act applies only to cream as a separate commodity. Mr. Justice Avory, concurring, said he could find no evidence to support the justices in their decision that the articles were sold as substances purporting to be cream. Lord Hewart had expressed the opinion earlier that it might be unfortunate, and in some cases entirely misleading, that composite articles should be sold under names including the word "cream." But the judges are obliged to confine themselves to what Parliament actually says; they cannot speculate on what Parliament might have meant to say.

Coroners and Post-mortem Examinations.

There was lately mentioned in these columns an inquest upon a young soldier who died after being run over by a motor-car. A medical witness had given evidence that the consequent injuries to the head were so grave that he deemed it unnecessary to make a full post-mortem examination; the coroner took the witness to task for the omission; death, he suggested, might have been due to heart disease. A converse case has since occurred as the result of an accident to a soldier at Chichester Barracks. It appeared that he had been practising a gymnastic exercise known as the "front dive" over two forms on each side of a bed-cot with a mattress on the further side—an exercise ordinarily performed in the gymnasium under experienced supervision. As the man came down on the mattress, he landed on his head. The depôt medical officer was summoned and the patient was removed to the Royal West Sussex Hospital where X ray examination showed a fracture of the vertebræ. At the inquest the senior house physician, Dr. I. F. W. Edwards, said he was unable to state on oath the cause of death; he did not personally think the injury to the vertebræ was sufficient cause; the deceased had been able to speak, and said: "hit neck in barrack-room last night jumping over forms." The Chichester coroner said he was satisfied that, though the doctors might not agree as to the exact cause of death, the man died from the injuries he received in making the dive; death was entirely accidental; nobody was to blame, and he proposed to return a verdict accordingly. Dr. R. Brooke, honorary senior surgeon at the hospital, protested; he had had charge of the case and was prepared to say that the deceased died from natural causes. Dr. Brooke, giving evidence at his own request, was of opinion that the man had a lesion of the brain which led to dizziness and that the accident was the result of that disease. He raised a point of principle as to the desirability of closer coöperation between coroners and medical practitioners in the matter of post-mortem examinations, and the necessity of ascertaining by all possible medical means the exact cause of death. The coroner replied that he had no hesitation in ordering a post-mortem where he thought it necessary; he had often been asked to make such order where he thought it absolutely unnecessary. He had come to the conclusion that the evidence showed death to be due to the accident; he had to ascertain the cause of death sufficiently for registration purposes, and he had a duty not to throw the rate-payers' money away on post-mortem examination fees.

There, since the coroner has the last word, the matter ended. From the merely legal point of view the coroner was doubtless justified. He had to decide whether or not to issue his order authorising the burial of the body. For this purpose he had sufficient material. There was no doubt of the facts of the accident, no suspicion of foul play, and no element of crime; the relatives, presumably, were satisfied with the investigation. But it was natural that the medical practitioners who had had charge of the case should wish that the fullest medical evidence should be made available and that it should be adequately considered before a judicial decision was made. Dr. Waldo, commenting lately in his court on the qualifications of coroners, stated that the 350 coroners in England and Wales consist of 310 with solely legal qualifications, 30 with solely medical qualifications, and 10 whole-time coroners possessing both kinds of qualification. More coroners, it seems, have a legal than a medical outlook.

Pay-beds at the Miller General Hospital.

The application to the Chancery Division for a scheme providing 50 "pay-beds" at the Miller General Hospital for South-East London, mentioned in THE LANCET of May 2nd (p. 981), has been further adjourned in order that the accounts for the year 1930, which have now been prepared, may be put in evidence.

Dangerous Drugs Act: Substantial Fine.

A doctor was fined £175 in the Manchester City police-court on April 24th on charges of unlawful possession of drugs other than for professional purposes, giving false particulars in prescriptions, and failing to keep a dangerous drugs register. There was no allegation of trafficking, but it was represented that the defendant had abused the privilege conferred upon him as a member of the medical profession. On the ten summonses taken out against him he had made himself liable to fines totalling £2500.

A Question of Ambulance Practice.

In consequence of adverse criticism [1] of the method followed in the London Ambulance Service of dealing with street accident cases, Sir George Hume, on behalf of the London County Council, has conferred with the Commissioner of Police for the metropolis as to the position of the ambulance when the attendants are rendering first-aid to injured persons in the roadway. It was agreed that, when an ambulance reaches a street accident case, the position in which it stops shall be a matter for the ambulance staff to determine, and that any police officers present will give all assistance in their power. Further, it was decided to add the following instruction to the ambulance service:

> When an ambulance reaches a street accident case and the patient is found to be lying in the roadway, the ambulance shall be stopped in the position that is most favourable for dealing with the case. In a busy thoroughfare the ambulance shall, if possible, be placed between the patient and oncoming traffic. When a police officer is present he will be responsible for keeping back bystanders and for the regulation of traffic until the case is removed, and he will aid the ambulance staff in any way he can. All accident ambulances will be furnished with a portable electric red lamp which shall be placed in the roadway, so as to show a red light in the direction of oncoming traffic during lighting-up time on every occasion when an ambulance is stationary in a public thoroughfare in connexion with a casualty.

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[1] See THE LANCET, Feb. 14th, p. 375.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

A NEW SWEEPSTAKES BILL.

LAST week in the Dáil Mr. FitzGerald-Kenney, Minister for Justice, introduced a Bill designed to extend the operations of the Hospital Sweepstakes Act. The Bill proposes to make certain hospitals mentioned by name, which were not eligible for participation in the sweepstakes under the existing Act, eligible in the future. The *principal of these* are the Royal Victoria Eye and Ear Hospital, Dublin, and St. Mary's Open-air Hospital, Cappagh. The feature of most interest in the Bill, however, is the provision for public (i.e., rate-supported) hospitals to benefit by the sweepstakes. Section 6 lays down that of the sums available for hospitals three-fourths shall be paid to the governing bodies of the promoting hospitals in proportions to be decided on by the Minister. Section 7 provides that the remaining fourth shall be paid to the Minister for Local Government and Public Health, who is to apportion it to the several counties and county boroughs in the Irish Free State in proportion to their respective populations. The share given in this way the Minister is to allocate as he shall think fit to such one or more of the hospitals for the sick poor of such county or county borough maintainable under the enactments relating to the relief of the sick poor. The sum so allocated is to be applied as the Minister shall direct for the improvement of the hospital or for its equipment. The Government appears to have some qualms lest the ratepayers should think themselves relieved of the responsibility of the upkeep of the public hospitals, and the succeeding provisions are intended to exercise some control. The allocation by the Minister of a sum to a particular hospital may be made conditional upon the fulfilment by the local authority of such conditions as he may think fit to impose. Again, it is provided that

> "Money allocated under this Section by the Minister for Local Government and Public Health to a hospital shall be in addition to, and not in substitution for, the moneys required for the ordinary maintenance of such hospital, and shall not be taken into consideration by the local authority by whom such hospital is maintainable by law when determining the amount to be expended by them on the maintenance of such hospital."

It is difficult to see how this provision can be made operative. The legal responsibility for the maintenance and equipment of the hospital rests on the local authority: for what purpose is the Minister to give his grant? Moreover, it is impossible to prevent the members of the local authority taking anything they choose into consideration whatever laws may say. In this connexion it is worth noting that last week the Westmeath Board of Health decided to postpone the consideration of all works involving capital expenditure pending legislation to enable them to benefit from the sweepstakes. The soundest provision in the present Bill is probably the concluding clause, to the effect that the Act shall remain in force for so long as the principal Act continues in force, and no longer.

PROBLEMS OF NATIONAL HEALTH INSURANCE.

A debate of considerable interest to the medical profession lately took place in the Dáil on the vote for the National Health Insurance. Mr. Mulcahy, Minister for Local Government and Public Health, in moving the vote, mentioned that he had succeeded in effecting considerable economies in the cost of the headquarters staff. Consultations were taking place with officials of approved societies and the doctors to see how far the increase in the cost of sickness benefits was due to laxity in certification or to increase of illness, or to both. In the ensuing discussion charges were brought by various deputies against medical men of carelessness or impropriety in the issue of certificates. Statements were made in particular that certain medical men signed *certificates in blank*, leaving them to members of their families to issue. Or again it was suggested that certificates were issued without an interview on the date of the certificate between the certifier and the member in whose favour the certificate was issued. Two of the medical deputies who spoke in the debate, Sir *James Craig* and *Dr. T. Hennessy*, suggested that if there were grounds for the charge that certificates were wrongly signed or issued by medical practitioners, such practitioners should be reported to the Medical Council. The Minister, in his reply, gave his opinion that the weakness in medical certification probably was not due to the doctors. The difficulty was the hesitancy of the doctors to put a person who had been in receipt of benefit back on the working list, but their certificates for two or three days had a material effect on the total amount of benefit to be paid. The fact, as appeared from figures quoted by Mr. Mulcahy, that the number of cases of cash payment, the number of certificates issued by medical practitioners, and the number of insured persons had increased in almost identical proportions in the past four years does not seem to have elicited any comment. An interesting point made by Mr. Hugh Law, in a criticism of the National Health Insurance system in general, was that it differed from an insurance scheme run on commercial lines in that a man who enjoyed good health all his life obtained no bonus or reduction of premiums.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED MAY 2ND, 1931.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 192; scarlet fever, 1570; diphtheria, 901; enteric fever, 27; pneumonia, 905; puerperal fever, 42; puerperal pyrexia, 115; cerebro-spinal fever, 61; acute poliomyelitis, 5; encephalitis lethargica, 13; continued fever, 2; dysentery, 3; ophthalmia neonatorum, 112. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on May 5th–6th was as follows:—Small-pox, 257 under treatment, 7 under observation (last week 222 and 6 respectively); scarlet fever, 1220; diphtheria, 1519; enteric fever, 10; measles, 160; whooping-cough, 439; puerperal fever, 33 (plus 10 babies); encephalitis lethargica, 148; "other diseases," 186. At St. Margaret's Hospital there were 21 babies (plus 10 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 46 (2) from measles, 4 (0) from scarlet fever, 24 (8) from whooping-cough, 22 (1) from diphtheria, 55 (13) from diarrhœa and enteritis under two years, and 74 (10) from influenza. The figures in parentheses are those for London itself.

Sheffield reported the only death from enteric fever. Only 2 deaths from meningococcal meningitis occurred in London. Ten deaths from measles were reported from Liverpool, 7 from Birmingham, 3 each from Leeds and South Shields. Birmingham reported 4 deaths from diphtheria, Liverpool 3. Diarrhœa accounted for 7 deaths in Manchester, 3 in Liverpool. The 64 fatal cases of influenza outside London are scattered over 37 great towns: 6 each were reported from Bradford and Leeds, 5 from Birmingham.

The number of stillbirths notified during the week was 286 (corresponding to a rate of 41 per 1000 births), including 38 in London.

CORRESPONDENCE

ORTHODOXY AND HETERODOXY IN SURGERY.

To the Editor of THE LANCET.

SIR,—I am so accustomed to read the writings of Mr. Ogilvie with profit, and with warm admiration not only for his surgical knowledge and good judgment, but for his mastery of the English language, that I too was surprised to read his statements with regard to the operation of gastro-duodenostomy. Now that another brief unhappy period of monopoly in the treatment of chronic duodenal ulcer by that ancient fetish the "triple carbonates" is nearing its timely end, and surviving cases are returning, disillusioned and disappointed, to the surgeon, it is necessary that the exact rôle, so far as we know it, of various surgical procedures relevant to their treatment should be accurately assessed.

Like Mr. Flint, I most strongly deprecate the operation of duodenectomy, which gives, with greater risk, no greater benefit to patients than do short circuiting operations combined, as they should always be, with destruction or infolding of the ulcer. Of the short-circuiting operations, gastro-duodenostomy may be difficult to perform, indeed it is not always possible. Vomiting may occur after it, and convalescence is not in every case so uneventful as after gastro-jejunostomy. With the limitations of the operation I have dealt fully in my book and need not repeat them here. I think I may sum up my attitude towards the surgical method to be practised in any case of chronic duodenal ulcer by saying that I think first of gastro-duodenostomy, and only when this seems likely to be difficult, impossible, or less desirable do I perform gastro-jejunostomy.

I have never lost a case of gastro-duodenostomy; I have never seen hæmorrhage that gave me the least anxiety; leakage from the suture line has not fallen within my experience; and I have never yet had to perform a secondary operation upon any case of my own for recurrence of ulceration. I hope Mr. Ogilvie will give the operation a further trial. In his most skilful hands it would I am sure prove satisfactory and earn his gratitude.

I am, Sir, yours faithfully,

Portland-place, W., May 11th, 1931. MOYNIHAN.

To the Editor of THE LANCET.

SIR,—I am sorry that my reference to gastro-duodenostomy has brought me into disagreement with Mr. Flint. The main grounds upon which he bases his advocacy of the method, that in his hands it has proved very successful, are unassailable, for Mr. Flint's work is well known and his results beyond question.

The gastro-intestinal junction is guarded by a sphincter under nervous control, whose functions are to prevent chyme leaving the stomach too rapidly and in too coarse a form, and to regulate the acidity of the gastric contents. The biliary and pancreatic secretions are probably directed also by a nervous mechanism, since they occur normally after gastro-jejunostomy and in persons with achlorhydria. When the pylorus is abolished, whether by excision or exclusion, emptying of the stomach becomes a mechanical process. The alkaline juices will be secreted as before, and will mix with the gastric contents at the stoma, wherever situated. It appears therefore that that opening will be most satisfactory which is made most easily, and which lies most naturally after completion. Mr. Flint rightly points out that the technical difficulties which I discussed are chiefly encountered in operations at the pylorus itself; but even in gastro-duodenostomy the parts employed for the stoma are thicker and more vascular than those concerned in posterior gastro-jejunostomy.

The chief difficulty in reaching any certain standpoint in the surgery of ulcer is that men of equal skill and experience hold entirely different views about the type of operation which is most suitable in any class of case, so that their opinions cancel each other out. It is probably fair to say that, apart from Prof. Wilkie, there are few surgeons of comparable standing to Mr. Flint who have as great an enthusiasm for the operation of gastro-duodenostomy.

I am, Sir, yours faithfully,

Harley-street, W., May 11th, 1931. W. H. OGILVIE.

DURACAINE IN SPINAL ANÆSTHESIA.

To the Editor of THE LANCET.

SIR,—It is all to the good that the excellent paper of Dr. Bernard Johnson on spinal anæsthesia, which appeared in the current issue of the *British Journal of Anæsthesia*, should be given a wider publicity in your columns. We must all feel grateful to Dr. Howard Jones for calling attention to it, especially as it is so capable of standing the fire of his criticism and coming through the ordeal not only unscathed but with enhanced reputation.

Dr. Johnson injected 100 spinal thecas with "duracaine" a solution lighter than cerebro-spinal fluid, and put the table "head up feet down" 10 degrees so that the lighter solution should rise. In 93 cases it did rise within a few minutes and a high anæsthesia was obtained. In seven cases the onset of anæsthesia was delayed, but eventually occurred. It is not clear whether these patients were in the "head down" position or not; they probably were not, Dr. Howard Jones assumes they were. Let us suppose he is right. He attributes the anæsthesia in these seven cases to the fact that the anæsthetic solution is really heavier than cerebro-spinal fluid and so flowed to the thoracic region as soon as, but not before, they were put in the Trendelenburg position. He says: "In other words the novocain will not go up hill, but waits for the Trendelenburg position, for this mixture becomes a hyperbaric [heavier] solution when diluted with cerebro-spinal fluid." How does he account for the high anæsthesia in the 93 cases when it occurred in the head-up position? Duracaine is a very remarkable liquid but it is not both lighter and heavier than cerebro-spinal fluid at the same time. It *is* lighter than cerebro-spinal fluid outside the body and 93 times out of a hundred in this series it acted as though it were lighter inside the body. It is therefore reasonable to suppose that it *is* lighter inside the body.

Secondly, the case referred to by Dr. Howard Jones of the 6-year-old child who received 200 mg. of novocain (as duracaine) is an excellent example of the safeguarding action of gliadin, for 150 mg. of novocain is considered by many authorities—*e.g.*, Prof. Forgue of Paris, Prof. Sebrechts of Bruges—as a super maximum dose for an adult. Yet this child of six received 200 mg. How is such a thing possible! The answer is that gliadin made it so. Gliadin limits the diffusion of novocain in the cerebro-spinal fluid and delays its absorption into the blood. After telling us that the respiratory centre can be paralysed by novocain, which is well known, Dr. Howard Jones says the centre was "badly *affected*," presumably with novocain. There is no evidence to that effect. All the evidence points to a very different conclusion. Here is the most relevant part of it. "Upon tilting the table more head downwards the patient's condition was *rapidly restored* to normal." What possible effect could tilting the table more head downwards have on a respiratory centre badly affected by novocain? Just none. The explanation is quite otherwise. Owing to the fall of blood pressure the venous return to the heart was inadequate, the heart was therefore failing and was not supplying the respiratory centre with blood. The centre was suffering from anæmia not novocain. An efficient Trendelenburg position immediately gave the heart its desire—namely, blood. The heart responded and gave the respiratory centre blood; the respiratory centre responded and gave the heart oxygenated blood, and the "patient's condition was rapidly restored to normal."

Dr. Johnson in the face of an alarming situation made a correct diagnosis and his treatment was as effective as his diagnosis had been prompt. Dr. Howard Jones in the quietness of his study misinterprets the situation.

I am, Sir, yours faithfully,
E. FALKNER HILL.
Manchester, May 10th, 1931.

SYPHILIS AND YAWS.

To the Editor of THE LANCET.

"The faintest streak that on a petal lies
May speak instruction to initiate eyes."
(Bryant—"The Mystery of Flowers.")

SIR,—Captain Butler of the U.S. Navy heads his letter in THE LANCET for April 25th with a quotation from William Cullen Bryant. I have followed his example; and I imply by my quotation, of course, that if Captain Butler has seen the streak on the petals of syphilis and yaws, his eye is not sufficiently initiate to appreciate the instruction available.

His communication amounts to this—that in his belief syphilis did not originate in America, and also that syphilis and yaws are one and the same disease. I am tempted to indicate briefly certain things which show that syphilis has not an European ancestry, and also that it and yaws are separate and distinct disease-entities.

Although Captain Butler says that "the ancient European ancestry of syphilis may be shown in a dozen ways, direct and indirect, and yet we find in current literature physicians subscribing to the moth-eaten fallacy that syphilis is of New World origin," nevertheless, he fails to mention one single way. If syphilis existed in the Old World prior to 1493, then all he has to do is to produce one reference to it before that date. He has only to cite one case of congenital syphilis, one case of tabes, one case of paresis, or one pre-Columbian syphilitic bone. But that, of course, he is quite unable to do.

Before the return of Columbus, all is silent upon the subject of syphilis. But shortly thereafter the new disease under divers names resounds throughout Europe, causing consternation and dismay. It behaves as a new disease, spreads as a new disease, and is recognised by contemporary physicians as a new disease. Nay more, it is immediately shown to have been introduced by the returned crews of Columbus, some of the men being infected—including the pilot, Pinzon—when they arrived in Palos on that fateful Ides of March. Las Casas and Oviedo, among others who visited the New World soon after, showed that the disease had been prevalent among the natives of America from time immemorial.

I am writing with a full knowledge of the joint paper by Captain Butler and Lieut. Harnandez in the *Southern Medical Journal* (vol. xxii., December, 1929); and here I would like to correct them upon one point. They state that there were no Spanish troops in the French army of Charles VIII. which carried out the invasion of the Kingdom of Naples. This is not correct. If they will read the first book of Ruy Diaz de Isla, they will find the following words: "And afterwards in the following year, 1494, the Most Christian King Charles of France, who then was reigning, having gathered a great army, passed into Italy. And at the time he entered the country with his host, many Spaniards infected with the disease were in it. . . ."

Of the duality of syphilis and yaws there is ample evidence. Of their unity, there is none. It is true that morphologically the parasite of yaws resembles that of syphilis; but then morphology counts for next to nothing. An ordinary brick which has been gilded may be morphologically indistinguishable from an ingot of gold. It is their different *behaviour* which matters. So with the *Treponema pallidum* and the *Treponema pertenue*. One behaves in a different way to the other. Yaws does not exist in a congenital form—i.e., the child does not acquire the infection in utero. In contrast with syphilis the primary lesion of yaws is seldom genital, and it is usually preceded by marked constitutional symptoms. Endarteritis is absent in yaws whereas it is characteristic of syphilis. In yaws there is little or no adenitis, the type of exanthem is single, there is great itching, alopecia is absent, and so likewise is iritis. From a yaws-infected mother no child is born who develops notched teeth, interstitial keratitis, eighth nerve deafness, oral fissures, or saddle nose. Yaws and syphilis often coexist in the same person. The one disease does not confer immunity against the other. Yaws does not give rise to tabes, paresis, or aortic aneurysm.

I have just read the letter of Dr. Stannus in THE LANCET for May 2nd, and I am inclined to differ from him in what he says with regard to sibbens—namely, that it is a "non-venereal epidemic syphilis." I rather regard it as being an European type of yaws. With respect to the remainder of his letter I agree.

In conclusion, I would point out that it would not be valid for Captain Butler to argue the European antiquity of syphilis by showing that yaws—framboesia, sibbens—was known in the Old World before the discovery of America, without first proving that yaws *is* syphilis. He must avoid the fallacy of *petitio principii*.

I am, Sir, yours faithfully,
E. TYTLER BURKE.
Municipal Clinic, Regent-road, Salford, May 8th, 1931.

SWEEPSTAKES AND VOLUNTARY HOSPITALS.

To the Editor of THE LANCET.

SIR,—The treasurer of St. Thomas's Hospital is very sceptical of the benefit to be derived from an English version of the Irish hospital sweepstake. But supposing the sweepstake were promoted by either the State or the local authority, in relief of the taxes and rates—what then? Germany can give us reliable data. Could we not pay off the "dole" debt, finance a specialist and clinic organisation for the National Health Insurance scheme, and perhaps get the income-tax in more quickly, if there were a gambling element in the matter? If the contribution to the National Health Insurance or income-tax carried a ticket per £1 for some lottery—the winner need not be drawn by a horse!—surely we should pay up far more readily, and have something of considerable psychological value in the way of interest. We should have something of a counter to the very disagreeable feelings aroused by the payment, or even the mention, of a compulsory tax, to such of us as still have a feeling that our money is our own, and that, being adult, we should be allowed to spend it in our own way, provided this is not directly harmful to others.

I am, Sir, yours faithfully,

H. G. P. CASTELLAIN, M.D. Cantab.

Moseley, Birmingham, May 8th, 1931.

TOXIC EFFECTS OF LUMINAL.

To the Editor of THE LANCET.

SIR,—I would like to add one important symptom of luminal poisoning to those described by Dr. R. W. L. Pearson and Dr. H. S. Pemberton in your issue of March 21st. In one of the cases I have seen, the acute symptoms appeared as a result of taking about a drachm of luminal by mistake. The patient was almost unconscious and had suppression of urine for more than 48 hours. Cupping in the kidney region was done but there was no response. On the third day the toxæmia had increased and the operation of capsulotomy of the kidneys was suggested. But before any operative measures of doubtful value were undertaken it was decided to give medical treatment a full chance. As a last resource it was decided to give 2 per cent. sodium sulphate intravenously. Accordingly, about a pint of the sterilised solution was injected and to the great relief of the patient and the attending staff a few ounces of urine were obtained on catheterisation about eight hours later. The urine continued to be secreted slowly and there was no necessity for repeating the intravenous injection. The patient made an uneventful recovery.

I am, Sir, yours faithfully,

P. L. DESHMUKH, M.B., B.S. Bombay,
Hon. Clinical Pathologist,
B.J. Medical School, Poona, India.

April 21st, 1931.

PANEL AND CONTRACT PRACTICE

Diagnostic Aid in Insurance Practice.

ALTHOUGH ample facilities exist for the provision of drugs for insured patients none has yet been made for laboratory diagnosis. It is true that when the service was established the laboratory did not occupy its present position in diagnostic medicine, while the bottle of medicine held almost undisputed sway—a domination which has been maintained, possibly even strengthened, by arrangements made under the Insurance Acts. "Treatment without diagnosis" has been suggested as a suitable slogan. Attempts to induce the Ministry of Health to include within insurance benefit some facilities for diagnosis have hitherto met with no success. A step forward has been brought about by the action of the British Medical Association in promulgating a schedule of fees for the performance of various laboratory procedures in general use in clinical medicine, and in arranging with a number of pathologists attached to general hospitals and clinical laboratories to undertake examinations for insured persons and their dependants at the rates therein laid down. This schedule, together with the names of the institutions undertaking the work, has now been circulated to panel committees. No funds are available for the working of the scheme, and the fees for the examinations must be a charge either upon the patient or upon the medical man asking for them. This fact makes it probable that the volume of work done under the scheme will not be great.

The schedule of fees was drawn up by the Consulting Pathologists' Group of the B.M.A., with the assistance of the council of the Association of Clinical Pathologists, and represents the first real attempt in this country to make the fees for this class of work approximate to the actual cost. It is the result of much actuarial work based upon the work done and the costs of maintenance of a number of laboratories throughout the country. Investigation showed that much of the pathological work at present done represents a charge on the institution performing it, a fact which has escaped notice inasmuch as most of these institutions depend for their maintenance not upon the fees received but upon the rates or charitable or educational funds. No doubt the vaccine has to some extent served to redress the balance. Insurance committees have been known to pay as much as ten guineas for an autogenous vaccine for a patient under their charge, although in the opinion of those who drew up the schedule two guineas represents a reasonable flat rate for all preparations of this kind. In view of the highly specialised nature of the work the scheme is framed to utilise the laboratories attached to general hospitals, an exception being made for certain laboratories engaged in clinical pathological work.

Hospitals, Drugs, and Panel Patients.

We learn from the *Manchester Guardian* that the board of management of the Eccles and Patricroft Hospital will persist in their effort to have the hospital placed on the list of dispensing chemists under the National Health Insurance Acts. The object is to make the hospital eligible for payment on account of drugs and dressings supplied to insured patients. The hospital was informed by the insurance committee that no application could be considered unless it complied with the terms of the Pharmacy and N.H.I. Acts. The hospital has become incorporated and is now assured by counsel that the legal provisions of these Acts have been fully complied with by incorporation. During the last 20 years the hospital, it is stated, has supplied over £10,000 worth of drugs and dressings to panel patients without recompense, and while they do not claim to participate in the drugs fund the board of management do consider they have a claim on insurance funds to cover the cost of drugs and dressings given to insured persons while in hospital.

QUEEN CHARLOTTE'S HOSPITAL.—At the annual meeting recently Sir Samuel Scott, the chairman, said that if the whole hospital could be moved to the new site in Goldhawk-road, Hammersmith, it could be made a centre of post-graduate teaching in obstetrical work and for the training of students, but to do that £200,000 was required. Meanwhile last year's expenditure exceeded the income by £6600.

OBITUARY

HENRY BRIGHT WEIR, M.B. Camb.

Dr. H. B. Weir, whose death occurred on May 4th, was the younger son of the late Dr. Archibald Weir, of Malvern. Born in 1880 he was educated at Harrow, where he played for the football eleven and was its acting captain in 1898. He was also a great runner and won many cups at the school sports, chiefly for the mile and half mile. In 1899 he entered Trinity College, Cambridge, taking honours in science, proceeding to St. Thomas's Hospital where he took the Conjoint diploma in 1907, and held a resident appointment. In 1910 he took the M.B., B.Chir. Camb., was appointed Louis Jenner research scholar in pathology for 1911 and 1912, and became assistant director of the Louis Jenner clinical laboratories and demonstrator of clinical pathology. When the war came he obtained a commission in the R.A.M.C., and became acting director of the laboratories, when much of the teaching in addition to the pathological work fell on his shoulders. To these he devoted his entire time and energy without stint, carrying on alone the work usually shared by several, and with conspicuous success. The war over, he was asked to make room for others, and thus severed a connexion of over 15 years with the hospital he had served so well.

DR. WEIR.

[Photograph by Jas. Bacon.

In 1918 Dr. Weir was appointed assistant lecturer in pathology at Charing Cross Hospital, and from there he went, in 1920, as pathologist to the National Hospital for Diseases of the Heart in Westmoreland-street, where he was working less than two hours before his death. At this hospital he became interested in causes of sudden death. He published, with others, a series of cases of death from ruptured heart, due to joy, grief, and many other causes, which he thought might be more common than was generally believed. The museum of this hospital is now, thanks to his efforts, one of the finest of this type in the country. During this period he was increasingly engaged in the scientific application of his branch of medicine to medico-legal needs. For many years he was one of the pathologists attached to the Coroner's Court for Central London. Dr. Ingleby Oddie tells us that he was a most painstaking and careful pathologist, sound and reliable in his work, an excellent witness, and a man of great personal charm. Dr. Oddie adds: He never expressed an opinion without clear grounds to support it, and was one of those quiet, modest people whose work was always characterised by signal efficiency.

One of his younger associates writes: "H. B. Weir or Goyle, as his intimates were privileged to call him, will be really missed by those who had the good fortune to count him among their friends. He was not easy to get to know, but once admitted to his confidence one had a very true friend. Having known him well for 15 years the characteristic which stands out strongly is his reliability; we could always count on his help or advice and feel certain it was the best we could get. 'Ask Goyle' was almost a bye-word with some of us. His kindness was proverbial; during the war he used to ask a few of us to dinner and then take us over to the laboratory and coach us in pathology, not officially but simply to help. Lenient where the faults of others were concerned, he was if anything over-conscious of what he considered his own shortcomings. He was a brave man; knowing so much of heart disease and fully aware of his own condition he was never heard to complain or give way to depression, but faced it cheerfully and carried on. He died at his home, as he would have wished, at the end of a day's work."

In 1926 Dr. Weir joined the Order of Crusaders whose object appealed strongly to him, being that of keeping alive the war-time spirit of "helping lame dogs over stiles." He was Master of his Conclave for this year and Member of the Grand Conclave. He leaves a widow and two young children.

JESSIE LAMB, M.B.Lond.

Dr. Jessie Lamb, who died on May 1st at Bath, after a serious operation, had been associated for many years with St. Catherine's Hospital, at Amritsar, India. She was the youngest child of the late Canon B. Lamb, and was born at Wheldrake, near York, in 1877. She was educated at the Leeds High School, at Westfield College, and at the London School of Medicine for Women, taking her medical degrees in 1903. Before going to India in 1906 she held resident appointments at Bermondsey Medical Mission and at the Elizabeth Garrett Anderson Hospital. For four years she worked under the Church of England Zenana Missionary Society at St. Mary's Hospital, Tarn Taran, in the Punjab, and in 1910 she went to Amritsar. The St. Catherine's Hospital there had been founded 30 years earlier by Miss S. S. Hewlett as a centre for training Indian midwives; to-day it has 100 beds with an annual turnover of 1700 in-patients and 15,000 out-patients. There are several Indian doctors and nurses on the staff, and when during recent troubles in India the English staff, as a precautionary measure, left the city and slept in cantonments, Dr. Lamb remarked: "It was the proudest moment of my life when I walked out of my hospital knowing that my Indian fellow workers would carry on the work just as efficiently as if we were still there." Dr. Lamb's service to India was recognised in 1920 by the bestowal of the Kaisar-i-Hind silver medal. Two of her sisters went out as missionaries under the same society; another sister who trained as a nurse at the Sussex County Hospital went out to Amritsar in 1911 and is still there.

THE LATE SIR BYROM BRAMWELL.

We have received from Prof. G. Lovell Gulland the following eloquent and just appreciation of Sir Byrom Bramwell, his chief and colleague:—

"The death of Sir Byrom Bramwell removes a great figure and a great name. Not every physician is a hero to his assistant physician, but during our long partnership in that relation I admired him more and more, and have always retained my veneration for him. When he was promoted to the physicianship in 1892 to take charge of the women students, who were then first admitted to the Infirmary, I was appointed assistant physician and assigned to him. He was full of the delight of having wards, and as he was not yet overwhelmed with practice, he spent long hours in investigating his cases, often with myself as a fascinated helper. From him I learnt the invaluable lesson of clinical thoroughness, and also of pathological thoroughness, for we used to go together to do post-mortem examinations on private cases, and on cases which had been in his wards, and which he had followed up, often for years. As time and his great reputation brought an increase of practice the hours that he was able to spend in the wards became shorter, but he regularly supplemented them by constant study of case-records at home. This made him more dependent on his resident physicians, but he was able to command the services of the best graduates, and was singularly fortunate in his selections. To them, as to me, his vast knowledge of clinical medicine was a revelation, as it was also to outsiders. An eminent London physician once said to him in my presence: 'Every time I hear of you, Bramwell, it is as an authority on some fresh subject.' While he was best known as a neurologist, his work on the heart, on anæmia, and diseases of the ductless glands and other subjects was in the first rank in its day. His monumental 'Atlas of Clinical Medicine' has never been equalled, but his 'Clinical Studies' were more widely read than any other of his publications and more appreciated by the profession at large. They were the outcome of his famous 'Wednesday Cliniques,' which were held in the 'Duck Pond' below Ward 28, and which were always crowded to the doors and windows; so much so, indeed, that some of his colleagues enjoyed a happy respite from teaching on that day. I never knew him as a systematic teacher, but as a clinical teacher he was superlatively good, clear, concise, dogmatic when it was possible to be so, cautious when it was not, bringing to the illustration and elucidation of a doubtful case the whole of his vast experience. He *was* the Edinburgh method of teaching at its best.

"We thought that his opportunity and that of the school had come, when at the death of Grainger Stewart the chair of Medicine became vacant. Bramwell presented a marvellous collection of testimonials from every part of the world, a wonderful evidence of his fame and reputation, but to our—and his—bitter disappointment he was not elected. In spite of this he carried on his work as keenly as ever. When his term as physician came to an end his colleagues and friends entertained him to dinner in the College of Physicians, an occasion of happy memory, and an honour which has not been extended to any other clinician. After his retirement from the Infirmary he long continued to be active in practice, but made few public appearances. How much this was to be regretted was evident when his colleagues chose him as President of the Association of Physicians on the visit of that body to Edinburgh in 1923. His conduct of the meeting was admirable, and his summing up of some of the discussions was in his old masterly style. Only a year or two ago, as one of the senior members of the consulting staff of the Infirmary, he presented to Mr. W. S. Caw, on behalf of the whole staff, a memento on his retirement from the post of Secretary and Treasurer to the institution. His speech was full of grace and dignity, with a touch of pathos.

"*But his fame as a teacher and investigator* were often forgotten by his friends in their love of the man himself. He was always approachable, always interested more in your doings than in his own, *glad to give advice if it was asked*, but never thrusting it upon you, kindly, even-tempered, but not sparing a rebuke in season if he thought it would do good. He was a keen sportsman. By the time I knew him well he had given up the *more* active sports, and settled down to fishing. I remember well one hot August afternoon by the Tummel when I came upon him in his shirt-sleeves wielding a big two-handed rod and getting fish when I couldn't raise them. Many a fishing story I have heard from him in his work-room in Drumsheugh Gardens, when with the inevitable cheroot in full blast he would forget work and worry in the tide of memory. He was the best of company. He had been a keen whist-player, and one day expressed a desire to learn bridge. Haultain, Norman Walker, and I taught him the game one evening at my house, and when we separated about 3 A.M. he was the winner. To the end he was keenly interested in the school and in medicine. About a year ago he asked some of his old residents to dine with him, and aged though he was, he made us all talk about our doings and was as interested and sympathetic as of old.

"All over the world his students will regret him and feel that they have lost not only a teacher and a source of inspiration, but a friend. His memory will endure long after they, too, have departed."

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Comdr. J. M. Horan is placed on the Retd. List. A. F. Davy to be Surg. Lt.

Surg. Lt.-Comdr. J. M. M. Wright to *Hood*. Surg. Lt.-Comdrs. (D.) D. H. Le Marchant to *Excellent*; F. R. P. Williams to *Malabar*, for R.N. Hospital, Bermuda; A. W. Wallace to *Greenwich*; and D. Paterson to *Pembroke*, for R.N. Barracks, Chatham. Surg. Lts. J. G. Ollerenshaw to *Vernon* and L. P. Spero to *President*, for two months' post-graduate course. Surg. Lt. (D.) H. A. Ginn to *Vivid*, for R.N. Barracks, Devonport.

ROYAL ARMY MEDICAL CORPS.

Lt. (on prob.) O. Ive resigns his commn.

ARMY RESERVE OF OFFICERS.

Lt.-Col. G. K. Maurice (Maj., ret. pay) to be Lt.-Col.

Capt. A. J. R. O'Brien, from the Gen. List, Res. of Off., to be Capt., retaining his present seniority.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Capt. E. Holmes from Active List to be Capt.

INDIAN MEDICAL SERVICE.

Capts. to be Majs.: M. K. Kelavkar and H. M. Strickland.

To be Capt. (on prob.): E. P. Carroll.

To be Lts. (on prob.): B. Temple-Raston, G. K. Graham, A. W. West, Mazhar Hussain Shah, M. K. Bryce, J. Guthrie, J. E. S. MacDonald (since deceased), H. R. Macevoy, M. M. Mansfield, J. L. O'Neill, *and* W. J. Stewart.

ROYAL AIR FORCE.

Flight Lt. P. J. Nyhan is transferred to the Reserve, Class D (ii), and is employed with the Regular Air Force for one year.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

PROPRIETARY MEDICINES BILL.

On Monday, May 11th, in the House of Commons Dr. **Hastings** presented a Bill to regulate the manufacture, sale, and advertisement of certain medicines and surgical appliances; and for purposes connected therewith. A forecast of its provisions appeared in a leading article in our issue of March 28th (p. 707). The Proprietary Medicines Bill seeks to make it unlawful for any person to manufacture or prepare for sale any proprietary medicine, or any proprietary surgical appliance, unless he is duly registered under the Act as the owner of the medicine or appliance, or his authorised agent. The medicine or appliance must also be registered and particulars must be forwarded to the Registrar (who will be appointed by the Minister of Health) showing the ingredients used in the preparation of the medicine. These ingredients must be specified in the Register. The Registrar must not disclose any information concerning the formulæ to any person except the authorised owner or agent. The Bill makes it an offence to advertise any proprietary medicine or appliance for the prevention, cure, or relief of a number of diseases specified in a schedule to the Bill, including cancer, consumption, diabetes, epilepsy, paralysis, and Bright's disease. Dr. Hastings, the introducer of the measure, has the backing of medical and lay members of Parliament belonging to all the three parties. The names on the back of the Bill, in addition to that of Dr. Hastings, include Lieut.-Colonel Fremantle (Unionist), Dr. Morris Jones (Liberal), and Dr. Salter (Labour).

HOUSE OF LORDS.

WEDNESDAY, MAY 6TH.

THE TWENTY-FOUR HOUR TIME-TABLE.

Lord **Newton** moved: "That in accordance with the recommendations of the Home Office Committee appointed in 1919 to report upon the advisability of adopting for official and other purposes the 24-hour method of expressing time, the Ministry of Transport should invite the railway companies to adopt this system from a certain date, and that it should be simultaneously introduced into the Post Office." He said that the Government in 1919 appointed a Committee, which was presided over by Lord Stonehaven. They examined a large number of witnesses of all kinds, scientific, commercial, persons interested in shipping, military, and naval authorities, and railway authorities. They reported that the 24-hour system had been found completely satisfactory wherever it had been tried, and that it caused no inconvenience because the old and the new systems were quite easily worked together. They recommended that the railways should be invited to put the new system into effect and that at the same time the Post Office should give the railways the necessary lead by introducing it into their services. No legislation was required and no public expenditure, beyond the alteration of date stamps and hours on pillar boxes by the Post Office, would be involved. In view of these recommendations it seemed surprising that the change had not been made. The recommendations of the Stonehaven Committee had been completely ignored. The request he was putting forward was of a very modest character. It was insignificant compared with the much greater reform of summer time, the greatest boon, perhaps, that this generation had ever experienced. If the 24-hour system were adopted it would remove many inconveniences.

Lord **Stonehaven** said he was in favour of the change in 1919 when he presided over the Committee which examined this question, and nothing that had occurred since had led him to think that the Committee were wrong in submitting that the 24-hour system would be an advantage and an improvement.

Lord **Banbury** said he hoped the Government would adhere to their former decision. He could see no object in changing what they had been accustomed to all their lives, nor in asking the railway companies to spend money in altering their time-tables, clocks, and various other things.

Lord **Lamington** said our present system of time-keeping was distinctly artificial and the reasons given for a change to a simpler system were overwhelming. The change was bound to come. In these days when intercommunication from one part of the world to another was so rapidly developing it was impossible to conceive that the various air services could work on any other system than the 24-hour table.

Lord **Monkswell** said that for a long time something simple and convenient like the 24-hour system had been a crying necessity. He hoped that the Post Office and the railways would abandon their attitude of opposition and would accept this reasonable reform with a good grace.

Lord **Trenchard** said the 24-hour system had been found necessary in connexion with flying, and he hoped it would be adopted universally.

THE WISHES OF THE PEOPLE.

Lord **Moynihan** said he hoped that the Government would not listen to the request of Lord Newton. No greater mistake could be made than to suppose that the people of this country desired to live under good laws. They desired only to live under laws which they made themselves, and the law which divided the day into two periods of 12 hours seemed to him to be consonant with the wishes of the people. He (Lord Moynihan) might make the claim—he hoped it was not an arrogant one—that he had travelled more upon the railways than any other noble lord present. He had never confused A.M. with P.M., nor did he think it the least likely that he would ever make so grave a mistake. If they had a 24-hour day they would find great difficulty even with so large a clock as that attached to Big Ben in distinguishing exactly to what hour the hour hand pointed. It was true that very high, perhaps the highest, scientific authority in this country, the Astronomer Royal, had twice forcibly expressed himself in agreement with Lord Newton. He (Lord Moynihan) had every consideration for the opinion of his old friend Sir Frank Dyson, but he would point out that the language of the laboratory was not the language of the everyday common room. For example, they spoke of the daisy and the primrose, not of the *ranunculus*, which was qualified by some hideous epithet or another. It would be a pity if they allowed the language of science to step in and replace the everyday and much more attractive words that were in use. He did not know whether their lordships had recently been so happy as to consult their physicians. If they had they would find on the prescriptions provided, in the top left-hand corner, some sort of hieroglyph which looked as though a fly had dropped into the ink bottle, had managed to escape and deposit itself on the top left-hand corner of the prescription paper, and there had suffered many seizures of epilepsy. That hieroglyph was really an invocation to the god Jupiter that he would bless the various ingredients of the prescription which were written in Latin. He would remind their lordships, if they were not familiar with the fact, that the names of drugs were written in Latin in order that patients might not in the least understand what drugs they were taking, and that psychotherapy might be added to the benefit they received from the drugs. But there was really a very profound physiological reason why the day should be divided into two parts. All nature consisted of cycles. There was death and resurrection; there was ascent and decline; there was adolescence and the climacteric. St. Paul expressed a profound truth when he said, "I die daily." In all these matters there was a sort of rhythm in life. Whether it had to do with pulse beats, or the regularity of the heart, or the frequency of respiration, or what not, he could not say, but there was a feeling that there was a division of the day into two parts, one of increasing activity as the morning went on, reaching an altitude, and from then suffering a decline when the period of repose came on. The division of the day into two parts was not only in consonance with the wishes of the people of this country, but was a recognition of a profound biological truth that there were two periods in each 24-hour day, a period of what should be activity, and a period of what should be repose. He thought it was the common sense of the people of this country as against the lack of common sense in the people of other countries which made them wish to retain the double cycle in the 24-hour day. They were told that Britain was in isolation so far as other nations were concerned. He hoped it was. He hoped that not for the last time they would see the stubborn infrangible British common sense opposed to the freakishness and vapourishness of other nations on the Continent.

Viscount Churchill said that if the Government, the Post Office, and the country generally adopted the 24-hour system the railways would naturally fall into line. But until that was a *fait accompli* they naturally were not in a hurry to spend money and alter their time-tables, preferring to wait until the suggestion if it was adopted was in universal use.

USE IN MORE ADVANCED GOVERNMENT DEPARTMENTS.

Lord Marley (Under-Secretary for War), replying for the Government, said the discussion had produced a number of interesting speeches including the particularly brilliant speech of Lord Moynihan, which must have delighted their lordships. It was true that the more advanced Government Departments did use the 24-hour system. The War Office had used it for many years, the Air Force had come into line, and in civil aviation the system was bound to be universal. It was doubtful whether there was any real public demand for the change. Nevertheless, there had been a widespread expression of opinion in their lordships' House that some examination of this question ought to take place, and that the Government should in some way assist in the consideration of the problem. He was authorised to say on behalf of the Government that careful and sympathetic consideration would be given by them to the whole question raised by Lord Newton.

Lord Newton said that on the understanding that he was at liberty to question the Government again on the subject he would not insist on a division being taken that day. He would withdraw his motion.

The motion was by leave withdrawn.

HOUSE OF COMMONS.

WEDNESDAY, MAY 6TH.

Voluntary Milk Clubs in Schools.

Mr. R. S. Young asked the President of the Board of Education whether he was taking any action to encourage education authorities to organise voluntary milk clubs in the schools of their respective areas.—Mr. Morgan Jones replied: Yes, Sir. My Department are actively coöperating with the National Milk Publicity Council, and every opportunity is taken of bringing the Council's scheme to the attention of local education authorities and teachers.

Mr. Young: Is the right hon. gentleman aware that only 10 per cent. of the children in the country are now taking advantage of this excellent scheme, and will he therefore do his utmost to encourage this development throughout the country?

Mr. Morgan Jones: I can assure my hon. friend that every encouragement is being given. As a matter of fact the National Milk Publicity Council say that this year they provided milk for 600,000 children as compared with 350,000 last year.

The Census.

Mr. Freeman asked the Minister of Health when the information obtained at the recent Census would be available for the public.—Miss Susan Lawrence replied: It is expected that the first figures obtainable from the recent Census will be made available to the public in the form of the preliminary report within approximately two months from the present date.

Regional Town Planning.

Sir Kingsley Wood asked the Minister of Health whether the committee which was examining the reports of the regional planning committees had yet reported.—Mr. Greenwood replied: An interim report has been made by the committee and is now being considered.

THURSDAY, MAY 7TH.

Silicosis.

Mr. Rennie Smith asked the Home Secretary, arising out of the recommendations of the International Silicosis Conference of 1930, that every effort should be made to emphasise the necessity for a whole series of provisions relating to hygiene, including methods for reducing production and diffusion of dust, maintaining the purity of the air in the mines, and the provision of suitable means for ensuring personal hygiene, and what steps he proposed to take to ensure that these recommendations were put into effect.—Mr. Clynes replied: The particular recommendation mentioned in the question relates only to mines and does not, therefore, directly affect my Department. As regards, however, the protection of factory workers against exposure to dust, this question has, for many years past, received the greatest possible attention from the Home Office, and has been dealt with not only by general provisions in the Factory Acts, but also by special provisions included in various codes of regulations for industries in which dangerous dusts are produced. The need of strengthening and extending these provisions is constantly under review, and my hon. friend may be assured that every possible precaution will continue to be taken. I may add that the preventive measures recommended by the Conference were, I understand, based on the measures actually adopted and applied in this country.

Mr. Rennie Smith asked the Home Secretary what steps had been taken to carry out the recommendations of the International Silicosis Conference of 1930 that an international classification of the stages of silicosis and their radiological diagnosis be established and that research be undertaken on an international basis into the causation of silicosis and other diseases due to dust.—Mr. Clynes replied: The classification of silicosis mentioned in the report of the Conference was, I understand, unanimously adopted by the Conference, and I am advised that, having regard to the representative character of the Conference, it may be regarded as generally accepted. As regards the other recommendations referred to, the intention of the Conference was that each country should institute researches on the lines suggested and should communicate the results to the International Labour Office. So far as this country is concerned, the matter has been under consideration by the Committee appointed by the Medical Research Council to investigate silicosis and other forms of pulmonary disease, and I am informed that schemes of research drawn up by this Committee have now been approved and are being put in operation.

Mr. Train asked the Home Secretary (1) what sums had been contributed by Scottish quarry masters to the Workmen's Compensation (Silicosis) Fund; and what claims, if any, had been made on the fund from quarrymen in Scotland; and (2) whether he was aware that after a medical examination by the medical board appointed under the Sandstone Industry Silicosis Scheme, 1929, no case of silicosis had been found among the quarry workers in Scotland; and whether he had taken, or proposed to take, any steps to implement his promise to the Scottish quarry masters that, following on the medical examination, the question of their liability for levies under the scheme would be reviewed.—Mr. Clynes replied: The levies paid by the Scotch quarry masters to the Sandstone Silicosis Fund between April 1st, 1929, and March 31st last, amounted to £3931. Claims have been made in Scotland on the fund in one case of death, where the workman left dependants, and in two cases of partial incapacity. The promise given to review the rates of levy on completion of the first periodic medical examinations will be duly observed, but the examinations will not be completed for some time yet.

Vagrants' Accommodation in Leicestershire.

Mr. Winterton asked the Minister of Health whether he was aware of the conditions at Loughborough poor-law institution where men on tramp were required to sleep in hammocks instead of proper beds; and whether he would intimate to the poor-law authorities in Leicestershire that they must comply with the regulations of the Ministry of Health in that and other respects.—Mr. Greenwood *replied*: I am aware that at present the cubicles and one of the men's dormitories of the Loughborough casual wards are supplied only with hammocks or mattresses. *In the* other men's dormitory and in the women's ward there are proper bedsteads. I have called the attention of the Leicester County Council and the Leicester and Rutland Joint Vagrancy Committee to the requirements of the new Public Assistance (Casual Poor) Order, 1931, in this matter, and I am glad to say that the appropriate subcommittee have now recommended the supply of bedsteads throughout the wards.

Housing Survey in Islington.

Mr. R. S. Young asked the Minister of Health if the housing survey undertaken by the medical officer of health for Islington, on behalf of the joint committee, had yet commenced; what were the areas to be surveyed; and by what date was the report to be presented.—Mr. Greenwood replied: The reply to the first part of the question is in the *affirmative*. *The* areas to be surveyed are areas selected by the joint committee to which may hon. friend refers and, though no date can be fixed, it is hoped the report of the survey will be presented in the near future.

MONDAY, MAY 11TH.

Road Passes for Medical Practitioners.

Mr. Marjoribanks asked the Minister of Transport whether he would consider issuing to registered medical practitioners special road passes, or whether he would authorise the attachment of special signs, horns, or lights to the cars of registered medical practitioners, so that police officers on point duty should give them special facilities through traffic in cases of emergency.—Mr. Herbert Morrison replied: I would refer the hon. Member to the reply which I gave on this subject on Feb. 25th to Mr. Hore-Belisha.

[The question and reply referred to are as follows:—Mr. Hore-Belisha asked the Minister of Transport whether, in view of the urgent nature of calls made on doctors, he would consider allowing a distinctive sounding horn on their cars, as in the case of ambulances, so that the police in control of traffic would be enabled to afford them special facilities for proceeding on their way.—Mr. H. Morrison replied: Fire engines and ambulances are vehicles which are readily recognisable, and both the police and the general public do what they can to facilitate their expeditious passage when answering a summons. There is no distinction in appearance, however, between a doctor's car and an ordinary private car; and I should *deprecate any attempt* to establish a priority of right of way by the use of a distinctive type of motor horn or any other similar means, as such a course would *be open to serious abuse.*]

Mr. Marjoribanks: Is the right hon. gentleman not aware that this has become a matter of public controversy since then, and is he *also aware that Canada has adopted* this system, that it has worked well, and that I believe the terms for penalties in the case of improper use have also worked well, and will he look into the *matter in view of* Canadian *experience*?

Mr. Morrison: I have carefully considered the matter, but the number of priorities which would have to be issued would be so large that I am afraid it would involve serious interference with the free flow of traffic.

Mr. Marjoribanks: Will the right hon. gentleman look into the Canadian experience and see how it has worked?

No further reply was given.

Indian University Students in Britain.

Commander Oliver Locker-Lampson asked the Secretary for India how many Indian students are now in residence at English and Scottish universities and enjoying educational hospitality.—Mr. Benn replied: According to figures supplied by the institutions concerned, the total number of Indian students at present studying at universities, colleges, medical schools, and other educational institutions of similar standing in Great Britain is approximately 1740.

War Pensioners and Tuberculosis.

Mr. Hore-Belisha asked the Minister of Pensions (1) the number of men in receipt of disability pensions in respect of tuberculosis during the years 1928, 1929, and 1930, respectively, who had had their pensions increased as a result of the findings of the medical board that their conditions had deteriorated, and the number of men during the same period who had had their pensions decreased as a result of the findings of the medical board that their condition had improved; and (2) the number of reviews during the years 1928, 1929, and 1930, respectively, by medical boards of cases where disability pensions had been granted in respect of tuberculosis; and the *number of* cases during the same period where the disability pension had been withdrawn *on the* ground that the effects of tuberculosis had passed, or by reason of the pensioners having died as a result of the disease.—Mr. F. O. Roberts replied: The records of the Ministry do not enable me to state precisely the number of disabled officers and men pensioned for tuberculosis whose cases have been reviewed in the years referred to and, consequently, I cannot state the number whose pensions have been increased or decreased. I understand, however, that normally in a majority of the cases the pension either remains the same or is increased, while the number of cases in which the pension has ceased to be drawn on the ground that the effects of war service have passed away, is in comparison negligible. The deaths of tuberculosis pensioners reported during each *of the three* years were in 1928, 1450; in 1929, 1400; and in 1930, 1050; but the number of these cases in which death was due to the disability cannot be stated.

Veterinary Medical Research.

Lieut.-Col. Fremantle asked the Minister of Agriculture when it was proposed that the scheme now being prepared for the development and coördination of veterinary medical research should be *put into operation*; and whether an opportunity would be given to the House to discuss it before the details were finally decided.—Dr. Addison replied: The scheme is still under consideration and I cannot yet say when it will be put into operation. The subject can, of course, be raised when the appropriate Vote is before the House.

Mental Defectives in England and Wales.

Mr. Gordon Macdonald asked the Minister of Health the number of certifiable mental defectives in England and Wales for each of the five years ended Dec. 31st, 1930.—Miss Lawrence replied: Statistics are not available as regards the number of persons certifiable as mental defectives, but the number of persons detained under certificates under the Mental Deficiency Acts on Dec. 31st in each of the last five years is as follows: 1926, 20,091; 1927, 21,598; 1928, 23,275; 1929, 25,076; 1930, 27,811.

Ingredients of Margarine.

Mr. McElwee asked the Minister of Health the names of the various ingredients used in the manufacture of margarine in Great Britain during 1930; and the principal sources from which they were obtained.—Miss Lawrence (Parliamentary Secretary to the Ministry of Health) replied: My right hon. friend is not able to give information specifically relating to the year 1930, but he is advised that the principal ingredients normally used in the manufacture of margarine are various vegetable oils and fats, such as rachis, coconut, palm kernel, soya bean, and cotton seed oils, and rendered animal fats such as oleo oil and hardened marine animal fats. The ingredients are obtained from various sources, home and foreign, including West Africa and Manchuria for vegetable oils, and South America for *oleo.*

Inspection of Private Schools.

Mr. Marjoribanks asked the Prime Minister whether he would consider the introduction of legislation to make proprietary private schools subject to inspection by the Board of Education and the Ministry of Health. Mr. Morgan Jones (Parliamentary Secretary to the Ministry of Education) replied: My right hon. friend regards this *as a matter for consideration* when a report has been received from the departmental committee which was appointed by his predecessor last December to consider the position of all schools not in receipt of grant from public funds.

TUESDAY, MAY 12TH.

Women and National Health Insurance.

Mr. Morley asked the Minister of Health the number of women contributing to health insurance in this country in the years 1920 to 1921 and 1930 to 1931.—Mr. Greenwood *replied*: *The number* of women in Great Britain who were contributing for national health insurance purposes on Dec. 31st, 1920, was 5,061,000, and the corresponding figure on Dec. 31st, 1930, was 5,750,000.

Licensing in Scotland.

Mr. Duncan Millar asked the Secretary for Scotland when the Report of the Royal Commission on Licensing in Scotland would be issued.—Mr. Westwood replied: I understand that the Commission hope to be able to make *their report* towards the end of this month, and arrangements will be made for its presentation and issue as soon as possible thereafter.

MEDICAL NEWS

University of Cambridge.

On May 9th the following degrees were conferred :—

M.D.—H. K. Goadby, Alexander Sandison, S. E. F. Gooding, and W. G. S. Brown.

M.Chir.—R. W. Butler.

B.Chir.—V. H. Ellis.

At a congregation on May 9th approval was given to reports on the establishment of a university lectureship in pharmacology and a university demonstratorship in the department of experimental psychology.

Royal College of Physicians of London.

On May 7th diplomas of L.R.C.P. were conferred upon 58 candidates (50 men and 8 women) who have passed the final Examination of the Conjoint Board and have complied with the by-laws of the College. These candidates had not completed their examinations in time for the College meeting on April 30th.

The following are the names and medical schools of the successful candidates :—

Margaret Abernethy, Royal Free ; R. E. Adam, Oxford and St. Thomas's ; Margaret H. Banks, Royal Free ; G. Barwell, Guy's ; J. S. Batchelor, New Zealand and Guy's ; R. J. V. Battle, Camb. and St. Thomas's ; Jessie G. Belilios, King's Coll. ; L. P. B. Chamberlain, Univ. Coll. and St. Bart.'s ; S. Cimmering, St. Bart.'s ; G. T. Cook, Camb. and King's Coll. ; K. M. Cooper, Royal Free ; G. J. Cunningham, St. Bart.'s ; L. E. A. Dearberg, Guy's ; W. De Lacey, Cardiff and London ; S. D. De Silva, L.M.S., Ceylon and Univ. Coll. ; N. B. Fadia, M.B., Bombay ; L. Farris, Liverpool and Charing Cross ; A. C. Frazer, St. Mary's ; W. G. Glassco, McGill and St. Mary's ; T. N. Gledhill, Oxford and Westminster ; H. Goldenberg, London ; D. G. Gower, Camb. and Westminster ; L. J. Hackett, St. Bart.'s ; Kathleen M. L. Hall, Royal Free ; H. T. Halper, St. Bart.'s ; M. Halperine, M.D., Paris and London ; A. C. Hauptfleisch, Cape and Guy's ; N. Heath, Oxford and Westminster ; G. Holroyd, Leeds and Guy's ; J. H. Hunt, Oxford and St. Bart.'s ; A. L. Jacobs, Oxford and Univ. Coll. ; C. D. P. Jones, Univ. Coll. ; M. S. Khan, Middlesex ; Janet Y. Laidlaw, Royal Free ; M. M. Landau, Middlesex ; R. C. Langford, Camb. and St. Thomas's ; G. F. Lashmore and A. J. D. Lewis, Guy's ; H. M. List, St. Bart.'s ; A. W. Littlewood, St. Mary's ; B. F. Longbotham, Camb. and London ; A. P. McEldowney, Camb. and St. Thomas's ; G. B. Malone-Lee, Oxford and St. Thomas's ; T. P. Mulcahy, Camb. and St. Thomas's ; B. S. Nanjiani, M.B., Bombay ; J. L. Parker, Camb. and St. Thomas's ; J. Ross, L.M.S.S.A., Toronto and Charing Cross ; Eileen M. M. Shaw, L.M.S.S.A., Royal Free and Westminster ; H. J. Shorvon, St. Thomas's ; M. Shorvon, King's Coll. ; E. G. Sibley, Middlesex ; J. H. Spence, Camb. and St. Thomas's ; A. L. Thomas, L.M.S.S.A., Cardiff and Guy's ; J. C. Wharton, Guy's ; Eva M. M. Willett, Westminster ; G. M. Willey, King's Coll. ; O. S. M. Williams, Oxford and Westminster ; W. G. Wright, King's Coll.

Royal College of Physicians of Edinburgh.

A quarterly meeting of the College was held on May 5th with Sir Norman Walker, the President, in the chair. Dr. Thomas Ferguson (Falkirk), Dr. Ronald Douglas Mackenzie (Edinburgh), Dr. Ernest Watt (Edinburgh), and Dr. George Matheson Cullen (Edinburgh) were introduced and took their seats as Fellows of the College. Dr. George Hector Percival (Edinburgh), Dr. David Lees (Edinburgh), Dr. Margaret Black Martin (Edinburgh), and Dr. Joseph Ryland Whitaker (Edinburgh) were elected to the Fellowship. Dr. Robert Thin was re-elected a representative of the College on the Conjoint Committee of management of the triple qualification. The Freeland Barbour Fellowship was awarded to Robert Henry Slater, Ph.D.

Scottish Conjoint Examining Board.

Of 81 candidates recently entered for the final examination of the Board, the following were successful and have been admitted licentiates of the Royal College of Physicians of Edinburgh, the Royal College of Surgeons of Edinburgh, and the Royal Faculty of Physicians and Surgeons of Glasgow.

Loutfi Ahmed, P. M. Ballantyne, Paul Barron, D. A. Black J. S. F. Botha, John Boyle, Robert Bulman, Parshotam Dass, A. C. Devaraj, Amin Fazary, J. T. M. Fenton-Fyffe, Klass Graftdyk, D. M. I. Harmar, M. D. D. Jayawardana, S. G. A. Malek, R. E. Mullarky, Alexandrina M. M. Parker, W. R. Parker, G. S. Robertson, Joseph Rosenberg, George Rosenbleitt, Manmanathanatt Sarkar, D. W. Semmens, Ahmed Shabten, J. A. Shehid, J. E. Sprunt, Helen V. Tindal, H. F. Tindal, A. W. Turnbull, Mary T. Wilson, and W. R. Young.

D.P.H.—The following candidates have been admitted Diplomates in Public Health :—

N. W. Ahin, Helena E. Barrett, A. D. Gorman, B. N. Khan, Mary L. Liston, and F. F. Main.

The Cancer Hospital.

At the annual general meeting of this hospital, held on May 1st, Mr. R. H. Jocelyn Swan spoke on the progress made in the treatment of cancer. He said that radium certainly holds a place in the treatment of cancer, but that its field of usefulness is being narrowed down to certain forms of cancer in particular organs. In his view the attack upon a cancer by burying multiple needles containing radium into it held out more promise than the external application or even that form of treatment supplied by the bomb, and work in this hospital had been carried out on these lines. There was no doubt that primary growths of the tongue and in the uterus might in a proportion of cases be made to disappear with radium, but to acclaim this as a cure was misleading and showed ignorance of the disease. Unfortunately radium did not seem to have such an effect upon the secondary glandular spread, so that in many cases in which the primary growth had been cleared away the secondary growths still continued. A number of cases of cancer of the breast and other organs had been treated with radium with encouraging results, but further time must elapse before they could speak of cures. In many cases relief of suffering was obtained by radium. Mr. Swan did not wish to appear pessimistic by any means: in fact, he was still optimistic, but he thought the general public should realise that radium was not the certain cure for cancer that they had been led to believe it was by premature reports both in the medical and in the lay press. At present, except perhaps as regards the tongue, the uterus, and possibly, the breast, they must rely on the orthodox widespread removal of the diseased organ together with its lymphatic areas of spread, rather than be too far fascinated by a form of treatment which might lead to disappointment and to sacrifice of human life. He was of opinion that in radium we had a valuable adjunct to our methods of treatment, but it was a dangerous weapon, and should be in the hands of those alone who know not only how to use it, but when to use it, and to use it with minute care and precision. Another recent innovation in the hospital was being carried out by Dr. S. Wyard. By means of a special instrument[1] a series of photographs of the interior of the stomach could be obtained with one flash exposure. From the enlargement of these small photographs they hoped to be able to detect those early cancers in the stomach which give rise to symptoms often few or deceptive until the disease has passed the range of operative removal. The new wing of the hospital was approaching completion, and the increased number of beds for free patients, and those allotted to patients who could afford something towards their maintenance and treatment, would, said Mr. Swan, add considerably to their work.

University of London.

At a meeting of the University Court on May 7th it was reported that the late Mr. Clifford B. Edgar had bequeathed £1000 to the London School of Hygiene and Tropical Medicine for the promotion of research. For the further extension of the London School of Economics and Political Science the Rockefeller Foundation has offered a sum up to about £140,000.

Lebanon Hospital for Mental Diseases.

The thirty-second annual meeting of this hospital will be held at 3.15 P.M. on Tuesday, May 19th, at Friends House, Euston-road, London, N.W., with the Rt. Rev. Herbert Bury, Assistant Bishop of London, in the chair. Among the speakers will be Dr. E. W. G. Masterman, chairman of the General Committee, and Dr. J. Tylor Fox. The secretary's address is 55, Wellington-road, N.W. 8.

University of London Medical Graduates Society.

The annual meeting and dinner of this society was held at the Langham Hotel on May 11th. Sir John Rose Bradford, the President, presided over a gathering which included the Vice-Chancellor (Rev. Scott Lidgett), the President of the Royal College of Physicians of London (Lord Dawson), and the President of the Royal College of Surgeons of England (Lord Moynihan), both medical graduates of the University. The next dinner of the society will be held on Nov. 13th at Bristol.

Medical Tour in Central Europe.

A tour is being arranged for medical men in Central Europe from August 24th to Sept. 11th. The party will arrive at Linz on August 26th, and sail down the Danube to Vienna, where two full days will be spent. Four days will then be devoted to Pistany (Czechoslovakia) and its neighbourhood, after which there will be a further four days at Luhacovice. At each of these centres the bath establishments and other medical institutions will be shown. The tour will continue via Prague and Nuremberg. Particulars and terms may be had from the Pistany Spa Representation, 38, Sackville-street, London, W. 1.

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[1] See THE LANCET, Feb. 14th, p. 371.

Socialist Medical Association.

The first annual general meeting of this association was held at Conway Hall, Red Lion-square, London, on May 10th, when the President, Mr. Somerville Hastings, M.P., gave the address which appears on p. 1115. In the ensuing discussion Dr. Alfred Salter, M.P., said that there would be an enormous amount of prejudice to be overcome before the family doctor idea was swept away. The British public would resent dictation by a social directorate. The executive committee reported that since the inception of the association in October last a subcommittee had been collecting evidence in favour of a detailed policy for the establishment of a free socialised medical service. Another subcommittee had been organising lectures for members of the trades-union, labour, socialist, and coöperative movements. Representatives of the association were to attend the first International Conference of Socialist Physicians to be held at Carlsbad this month. It was agreed that the association should seek affiliation to the National Labour Party. Resolutions were passed opposing paying wards in, and charges being made at, municipal hospitals for infectious diseases, including tuberculosis, expressing the opinion that municipal and hospital treatment should at once be dissociated from the poor-law, and pressing for the establishment of nursing in the Ministry of Health and the raising of the income limit of national health insurance to £500 a year. The following were elected officers for the coming year:—

President, Mr. Somerville Hastings, M.P. Treasurer, Dr. Alfred Welply. Secretary, Dr. C. W. Brook, L.C.C. Trustees, Dr. Hector Munro, and Dr. V. H. Rutherford. Executive Committee, Dr. Bensusan Butt, Dr. Frank Bushnell, Dr. S. W. Jeger, L.C.C., Dr. Caroline Maule, Dr. A. V. R. Menon, Dr. J. Grant Morris, Dr. D. P. Murray, Miss Esther Rickards, M.S., L.C.C., Dr. M. Rose, Dr. Alfred Salter, M.P., Dr. John Powell-Evans (London branch secretary), Mr. F. Lawson Dodd (dentists' representative), Miss Gladys Le Geyt (nurses' representative), and Mr. Roy Dennison (students' representative).

The meeting concluded with an address by Prof. Major Greenwood, F.R.S., on the Municipal Hospitals, the University, and Medical Research in London.

Scientists' Tour in Russia.

Accounts of this tour were given in THE LANCET of Jan. 31st and April 18th (p. 887), and owing to the large demand for membership of the first party, the lists for which closed on April 30th, a second party will now leave London Bridge by Soviet ship for Leningrad on August 8th. The return fare will be £18 inclusive. The party will spend a total of 16 days in Russia—three days in Leningrad, five days in Moscow, half a day in Nizhni-Novgorod, and four days on the river down to Stalingrad (if desired). The cost per day will be £1 per head inclusive, the balance of the days being spent in travelling. Meetings will be arranged which members of the party will be invited to address, and there will be excursions with guides to scientific institutions of interest to the members. The Soviet authorities are prepared to give this tour second category accommodation at third category prices. The accommodation will be comfortable, and persons will sleep three or four in a room. Those wishing to sleep two in a room will pay 5s. per day extra. The party will consist of 25 persons. If there is a large demand for places the list might be extended. The latest date for receiving applications is June 15th. Inquiries should be addressed to the Secretary, Society for Cultural Relations, 1, Montague-street, London, W.C. 1.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, May 18th.—8 P.M., ODONTOLOGY. Annual General Meeting at the Royal College of Surgeons, Lincoln's Inn-fields, London, W.C. *Election of Officers and Council.* Casual Communications: Dr. E. W. Fish: An International Nomenclature of the So-called Pyorrhœa Group of Diseases. Demonstration: Sir Frank Colyer will show upon the screen some of the older dental instruments in the Museum.

TUESDAY.—4.30 P.M., SPECIAL GENERAL MEETING OF FELLOWS. Abolition of the Sections of Balneology and Climatology, and Electro-Therapeutics. Creation of two new Sections of Physical Medicine and Radiology.—5 P.M., GENERAL MEETING OF FELLOWS. Ballot for Fellowship.

THURSDAY.—5 P.M., DERMATOLOGY. (Cases at 4 P.M.) Election of Officers and Council. Cases: Dr. H. W. Barber: Extensive Atrophic Lichen Planus. Dr. H. W. Barber and Dr. L. Forman: *Sycosis Treated with Intradermal Vaccine.* Mr. Percival P. Cole: Rhinoplasty *after Lupus of the Nose.* An apparatus to maintain Wolff grafts, or radium applicators in position on the face. Dr. *W. N. Goldsmith: Case* for Diagnosis: ? Lichen Planus Atrophicus. Specimen of Mycosis Fungoides of Internal Organs. Other *cases will* be shown.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, W.

THURSDAY, May 21st.—8.15 P.M. (preceded by a demonstration at 7.15 P.M.), Dr. G. W. M. Findlay, Dr. J. L. Dunlop, and Major H. O. *Brown: Observations* on Epidemic Catarrhal Jaundice.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.

THURSDAY, May 21st.—2.30 P.M. (at B.M.A. House, Tavistock-square, W.C.), Quarterly Meeting. Papers. Dr. Norman Phillips: Mental Disorders associated with Pernicious Anæmia. Dr. W. F. Samuels: Antimalarial Work at Central Mental Hospital, Tanjong, Federated Malay States. Dr. Geoffrey Shera: Terminal Uræmia, with Notes on the Prevalence *of Renal Disease* among the Insane.

BIOCHEMICAL SOCIETY.

SATURDAY, May 16th.—2.30 P.M. (in Department of Biochemistry, Oxford), Communications and Demonstration.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, *Lincoln's* Inn-fields, W.C.

MONDAY, May 18th, and following WEDNESDAY.—5 P.M., Colonel Robert McCarrison: Experimental Research at the Pasteur Institute, India.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, May 18th to SATURDAY, May 23rd.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. M.R.C.P. Special evening lectures at 8.30 P.M. Tues., Dr. L. J. Witts: Jaundice. Fri., Dr. W. J. Adie: Diseases of the Nervous System, I. ROYAL NORTHERN HOSPITAL, Holloway-road, N. Wed., 2 P.M., Demonstration in the Out-patient Department by Dr. Calvert. No fee.—QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, E. Fri., 10 A.M., Demonstration of General Cases by Mr. Coyte. No fee.—ROYAL EYE HOSPITAL, Southwark, S.E. Afternoon course. Demonstration daily.—ST. JOHN'S HOSPITAL, Leicester-square, W.C. Afternoon and evening demonstrations in skin diseases. Lectures four days a week at 5 P.M.—CITY OF LONDON HOSPITAL FOR DISEASES OF THE HEART AND LUNGS, Victoria Park, E. All-day course in Diseases of the Heart and Lungs. Lectures and demonstrations.—Further particulars from the Fellowship of Medicine.

NATIONAL HOSPITAL, Queen-square, London, W.C.

MONDAY, May 18th.—12 noon, Dr. Greenfield: The Cerebrospinal Fluid. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Hinds Howell: Subacute, Combined Degeneration of the Cord.

TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Critchley: Cerebral Vascular Disease (2).

WEDNESDAY.—2 P.M., Dr. Martin: Out-patient Clinic.

THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Critchley: Cerebral Vascular Disease (3).

FRIDAY.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Carmichael: Birth Palsies.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

MONDAY, May 18th.—10 A.M., Gynæcological Ward Visit, Genito-Urinary Operations, Skin Department. 11 A.M., Surgical Ward Visit. 2 P.M., Medical, Surgical, Eye and Gynæcological Out-patients, Operations. Surgical Ward Visit.

TUESDAY.—Operations. 10 A.M., Medical Ward Visit, Dental Department. 11 A.M., Throat Operations. 11.30 A.M., Surgical Clinical Demonstration. 2 P.M., Medical, Surgical, Throat Out-patients, Operations, Medical Ward Visit.

WEDNESDAY.—Medical Ward Visit, Childrens' Medical Out-patients. 2 P.M., Medical, Surgical and Eye Out-patients, Gynæcological Operations. 4.45 P.M., Venereal Diseases.

THURSDAY.—10 A.M., Neurological Department. 11.30 A.M., Treatment of Fractures, 2 P.M., Medical, Surgical, and Eye Out-patients, Genito-Urinary Department. Operations.

FRIDAY.—10 A.M., Medical Ward Visit, Skin and Dental Departments. 12 noon, *Medical Lecture.* 2 P.M., Medical, Surgical, and Throat Out-patients. Operations.

SATURDAY.—9 A.M., Throat Operations. 10 A.M., Medical Ward Visit, Surgical and Childrens' Medical Out-patients.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, *Balham*, S.W.

THURSDAY, May 21st.—3 P.M., Visit to Clinic for Rheumatism, Peto-place, Marylebone-road, N.W. Dr. B. S. Nisse.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE, Keppel-street, Gower-street, W.C.

WEDNESDAY, May 20th.—Dr. Bernard Hart: Mental Hygiene.

FRIDAY.—Prof. E. L. Collis: Industrial Hygiene: Respiratory Diseases.

their ordinary avocations. Some kind of hostel where offenders on probation could live, under care, detached from a perhaps highly unsatisfactory home environment, yet continuing to earn their living, would be of the greatest possible value.

The question arises of who should provide these centres. Dr. Mary Barkas stated at the discussion that the Mental Treatment Act would empower local authorities to undertake this enterprise as part of their scheme for the mental health of the community. Others believe that it would not be satisfactory to leave an important national provision like this to local authorities; the failure of some of them to deal with their mental deficiency problem being quoted. The centres should most certainly not be part of the penal system of the country; Borstal is a part of this system, but industrial and reformatory schools and remand homes and all other provision for juvenile offenders come, as they rightly should, under the children's department of the Home Office. The observation homes would be part of the mechanism of the court to the extent that magistrates might use such powers of persuasion and force as they have at their command; otherwise the parent or guardian might be reluctant to allow the child to go to the centre. The psychopathology of crime—particularly juvenile crime—is a matter which doubly concerns the medical profession. It should make a strong appeal to every citizen, and it is time that there was sufficient pressure of public opinion to make a Children's Bill a first charge on any Home Secretary and not a measure that will get before the House only when there is nothing else in the way. The matter has also a peculiar appeal to doctors, in whose hands this delicate and difficult work of the future must almost inevitably be placed. Miss Cicely Craven, the Secretary of the Howard League, said very truly at the conference that the remand wards of our prisons are to the psychologist what the hospitals are to the physician and surgeon. They offer a collection of material—at present hardly realised—which could be investigated and treated, not only to the relief of the sufferers themselves, but also to the great good of the community as a whole.

AN AUTHORITATIVE LIST NEEDED.

To the Editor of THE LANCET.

SIR,—I note the reply in THE LANCET of April 18th (p. 896) to my question as to a list of persons properly qualified to offer certain assistance to practitioners. There seems to me no doubt as to the necessity of letting practitioners have the names of institutions or medical men to whom they may send patients for such service as reducing chronic dislocations, breaking down adhesions, resetting bones, manipulating joints, &c. But it should be required that the cases are treated *by someone on the Medical Register* who has experience in manipulative work. I think most of your readers will agree that this information should be supplied to medical men who require such assistance for their patients, in an authoritative list.

I am, Sir, yours faithfully,

May 6th, 1931. PHYSICIAN.

OUR OLDEST SUBSCRIBER.

To the Editor of THE LANCET.

SIR,—Under this heading Dr. James Gairdner in THE LANCET of March 14th says that he was born in 1846. He is by two years my senior. There are many medical men older than both of us I am sure, but my claim was that I was probably the oldest subscriber, as I have been a subscriber for 61 years without intermission.

I am, Sir, yours faithfully,

Bombay, April 16th, 1931. TEMULJI B. NARIMAN.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—The Cavendish lecture will be given at the Kensington Town Hall at 8.15 P.M. on Friday, June 5th, by Prof. Julian Huxley, whose subject will be Development in Relation to Heredity and Evolution. The reception begins at 7.45 P.M. and the annual conversazione will follow the lecture.

Births, Marriages, and Deaths

BIRTHS.

COPE.—On May 3rd, at Welbeck-street, W., the wife of Dr. C. F. Cope, Pulborough, Sussex, of a daughter.

LISTER.—On May 1st, at Clifton, Bristol, the wife of William A. Lister, M.B., of a son.

LE MARQUAND.—On May 2nd, at Lima House, Reading, the wife of Dr. H. S. Le Marquand, of a daughter.

LOCKE.—On May 5th, at "Elmcroft," The Causeway, Potters Bar, to Dorothy Norah, the wife of Robert Gibbs Locke—a daughter.

MAITLAND-JONES.—On May 9th, 1931, at 31a, Weymouth-street, to Miriam, wife of Dr. A. G. Maitland-Jones—a son.

THWAITES.—On May 7th, the wife of Dr. W. G. Thwaites, Brighton, of a son.

MARRIAGES.

TASKER—BUCKMASTER.—On May 6th, at St. Paul's Church, Clifton, Bristol, Dr. Ronald Henry Tasker, to Dr. Dorothy E. B. Buckmaster, only daughter of Prof. and Mrs. Buckmaster, of Victoria-square, Clifton, Bristol.

DEATHS.

BAHADURJI.—On May 3rd, at Lexham-gardens, London, Dr. J. N. Bahadurji, M.R.C.S., L.R.C.P., aged 61 years.

BONTOR.—On May 8th, at a nursing home, Hampstead, Sidney Algernon Bontor, M.D., of Lancaster-road, Hampstead, late of Great Berkhamsted, Herts.

DUKE.—On May 4th, at Fernhurst, Sussex, Arthur Stanley Duke, L.R.C.P.

HOPKINS.—On May 9th, at Glenorchy, Parkstone, Dorset, Arthur Henry Hopkins, M.B., C.M.

JENKINS.—On May 9th, at Ranelagh-villas, Hove, Arthur William Jenkins, M.B., B.S., aged 60 years.

LATCHMORE.—On April 1st at Taupo, New Zealand, in his 61st year, Arthur Thomas Latchmore, M.R.C.S., L.R.C.P., sometime surgeon to the Princess Christian Hospital, Freetown.

MUGLISTON.—On May 7th, at Chy-an-Dreath, Newquay, Cornwall, after a long illness, Thomas Crichton Mugliston, M.R.C.S., L.R.C.P., R.N. (retired), formerly of Singapore and Penang, aged 77.

ODELL.—On May 5th, at Bengeo, Hertford, Robert Odell, M.D., F.R.C.S., aged 63 years.

SCHOFIELD.—On May 10th, at The Homestead, Grosvenor-road, Caversham, Gerald Schofield, M.D.

THOMAS.—On May 9th, at Greystones, Sea Front, Hayling Island, Cadogan Thomas, M.R.C.S., L.R.C.P. Lond., in his 69th year.

TONKS.—On May 4th, at Chesterfield, John Wilson Tonks, M.A., M.D., B.Chir. Camb., F.R.C.S. Eng., aged 43.

WEIR.—On May 4th, at Park-road, N.W., Henry Bright Weir, M.A., M.B., B.Chir. Camb.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

MEDICAL WOMEN'S FEDERATION: ANNUAL MEETING. The annual general meeting of the Medical Women's Federation was held on May 7th at the Apothecaries' Hall, where the members were welcomed by Lieut.-Colonel C. T. Samman. The President of the Federation, Miss L. Martindale, M.D., thanked the Master for his welcome and the Court of Apothecaries for their permission to hold the meeting in these historic surroundings. The hon. secretary, Miss M. Ramsay, F.R.C.S., in presenting the annual report, pointed out several events of interest to medical women. Aberdeen Infirmary had appointed its first woman ophthalmic surgeon; a woman regional medical officer had for the first time been appointed by the Minister of Health, and a woman had been made a Commissioner of Lunacy under the new Board of Control. 127 new members had joined the Federation this year. A discussion, opened by Miss G. Herzfeld, F.R.C.S. Edin., took place on the facilities at present available for medical women for gaining post-graduate experience as members of resident staffs in general hospitals. The conditions existing in this respect in different parts of Great Britain were described by local representatives. In the evening a large gathering of members and their friends were entertained in the Great Hall of the British Medical Association house at a reception and cabaret supper. Amongst the resolutions passed at the Council meeting held on March 8th were a request that all post-graduate courses and facilities for study in medicine, surgery, and special subjects shall be available to men and women alike; a request that the Government should make provision that on the Governing Body of the Post-graduate Hospital and Medical School one of the governors shall be a medical woman nominated by the Medical Women's Federation; and the expression of an opinion that in areas where two venereal disease officers are appointed one should be a woman. In regard to the last resolution, it was added that in areas where such a course is impracticable, medical officers of health should take every opportunity of having female maternity and child welfare officers trained in the diagnosis and treatment of venereal diseases. In the evening the President entertained the members of Council to dinner at the De Vere Hotel.

ADDRESSES AND ORIGINAL ARTICLES

THE NEUROLOGY OF OLD AGE.*

By Macdonald Critchley, M.D. Brist.,
F.R.C.P. Lond.,
JUNIOR NEUROLOGIST TO KING'S COLLEGE HOSPITAL; ASSISTANT PHYSICIAN TO THE NATIONAL HOSPITAL, QUEEN SQUARE.

LECTURE I.

The subject of old age has never been a popular one with the medical profession. Among both savage and civilised peoples a certain lack of interest, and even of sympathy, is associated with the infirmities and maladies of the aged. Problems of diagnosis and of therapy tend to be neglected, to the detriment of the individual and still more of the community. Most contributions to the study of old age have been of a speculative nature, dealing with such aspects as causation and even prevention. A certain number of writers have devoted themselves to the more tangible problem of disease in old people, and within the last century a small series of monographs has accumulated.

Thus, ten years after Canstatt's work[1] which appeared in 1839, came Dr. G. E. Day's[2] "Domestic Management and Diseases of Advanced Life." The well-known work of Durand-Fardel[3] was issued in 1854 and Geist's[4] monograph in 1860; three years later Maclachlan,[5] who was the medical officer in charge of the Royal Hospital, Chelsea, published his "Practical Treatise on the Diseases and Infirmities of Advanced Life." Two important French monographs followed—namely, Charcot's[6] Clinical Lectures (1868) and the "Étude Clinique et Anatomo-Pathologique sur la Vieillesse" of Demange[7] (1886). At about the same time in this country Sir George Humphry[8] published his monograph on "Old Age," containing the results of a systematic investigation of the health and habits of a large number of centenarians. No further contributions appeared until 1909 when Schwalbe's[9] "Lehrbuch der Greisenkrankheiten" was published, and also in France Rauzier's monograph.[10] In 1913 Saundby's[11] book on "Old Age" was published, and in the same year Schlesinger[12] wrote his treatise on "Alterskrankheiten," a reprint of which was issued a few months ago. Nascher's "Geriatrics"[13] was published in 1919. In a class by itself is the delightful and informative Linacre Lecture delivered by Sir Humphry Rolleston[14] in 1922 on Some Medical Aspects of Old Age, and which is surely the most thoughtful and inspiring monograph on this subject.

I have been unable to trace, however, any volume dealing with the neurological aspects of senility, and the only contribution on the subject which I know is the Bradshaw Lecture delivered before this College in 1915 by Dr. Michell Clarke, on the Nervous Affections of the Sixth and Seventh Decades of Life.[15] Although monographs devoted to this problem are few, many brief but valuable contributions have appeared from neurologists who have been privileged to work as directors of institutions for chronic nervous disorders. Thus the work of Lhermitte and his pupils, and that of Schuster, are monuments of clinical observation and breadth of vision in this particular aspect of neurology.

To preserve this study from the pitfalls of discursive speculation we must content ourselves primarily with the mere collection of data; an exact knowledge of the clinical and anatomical facts is essential before we can discuss the neurological aspects of old age in a scientific and dispassionate manner. For this reason I have thought it wise to reverse the usual order of descriptive technique and to deal first with the pathological side of the problem. Furnished in this way with a picture of the anatomical processes we are better able to evaluate what we encounter at the bedside.

The Senile Brain.

In this first lecture we will consider the morbid changes seen in the nervous system of individuals who have died at an advanced age.

Contributions to the pathology of the senile brain have not been numerous. The earliest record which I have been able to trace was made by William Harvey[16] in the *Philosophical Transactions* for 1635. At the command of King Charles I., Harvey conducted a post-mortem examination on the famous Thomas Parr, of Great Wollaston, Shropshire, who died at the age of 154 years. Harvey mentions, after describing the various viscera, that the brain was "healthy, very firm and hard to the touch." In the fifth volume of the *Philosophical Transactions*, covering the period 1700–20, Dr. James Keill[17] recorded the autopsy appearances in one John Bayles, a button-maker of Northampton, who died at the age of 130. "The brain" we are told "was more firm and solid than usual, and, in cutting, hardly moistened the sides of the knife. The ventricles were full of serum." Dr. Keill relates that the patient had been blind for some years, but that the hearing was good. For some years prior to death the patient's bowels had been opened, on an average, once every 10 to 12 days.

Dr. Edward Holyoke, a respected physician at Salem, Massachusetts, died in the year 1829, having attained the age of 101. After his death, a committee of friends wrote a short appreciation and adding a collection of his letters and notebooks, published a little monograph[18]; a copy of this rare work is upon the shelves of the library of the Royal College of Physicians. Herein is included a description of the autopsy, and we learn that the dura was adherent to a very dense calvarium. The sulci were widened and deepened, and the cortex was unusually dark. The brain felt unduly hard . . . . "as if subjected to the action of alcohol." A disproportionate atrophy of the cerebellum was noted.

A short description was given by Berruti[19] in 1857 of the brain of an Italian who died aged 104 years. The chief point of interest was an extensive ossification of the dura mater.

Prof. George Rolleston's anatomical study[20] of John Pratt, who lived to 107 years, followed in 1884. Rolleston mentions that the meninges were adherent to the inner table of the skull and that the arachnoid was opaque in patches. The convolutions were atrophied, especially in the prefrontal lobe and the Rolandic gyrus. A moderate dilatation of the lateral ventricles was present, the lining membrane being smooth. Numerous corpora amylacea were visible microscopically beneath the ependyma.

Sir George Humphry's note in 1889[8] upon the pathological findings in a female of 103, makes the next contribution; we are told that the brain was shrunken, the fissures being broad and occupied by an excess of cerebro-spinal fluid. The skull was thick and heavy; weighing 28½ oz. In this paper Humphry quotes a personal communication from Prof. Cunningham, who in the same year had examined the organs of a woman of 106; he had found the brain firm and healthy in appearance, with wide separation of the gyri. A model of this brain was placed in the Museum of the University of Cambridge.

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* The Goulstonian Lectures for 1931, delivered before the Royal College of Physicians of London on March 10th, 12th, and 17th.

The most important landmark in our knowledge, however, is the work of André Léri,[21] who in 1906 published his thesis on "Le Cerveau Sénile." This monograph is still in many respects the most authoritative presentation of the subject. It was followed one year later by the papers of Anglade and Calmettes [174] on the histology of the senile cerebellum.

Within the past 20 years a few short contributions have appeared, mainly based on isolated cases. Thus there are the papers of Costantini (1911) [22] on the brain of a man of 105; of Marinesco and Minéa (1921 and 1925), who examined a number of Roumanian brains, including one of a female aged 105; of Kuczynski and Kopylowa (1925),[23] who studied minutely the organs of a man dying at 118, and a recent description by Askanazy [24] of a woman who died at 101. Oseki [25 26] in 1924 had studied the minute changes in the cortex and basal ganglia in a series of octo- and nona- genarians.

In addition to these data, there are a few interesting studies of the brains of various eminent individuals dying in late life. Thus we have Louis and Chambardel's [27] investigation of the brain of Anatole France, who died at the age of 84½, Mauer and Weimann's [28] description of the brain of Ernst Haeckel, who was aged 86. The brains of Mommsen the historian (aged 87), and Bunsen the chemist (aged 89) were also examined minutely. Spitzka [29] made a careful anthropometric investigation of the brains of six eminent American scholars, and in his monograph detailed similar studies of 137 outstanding individuals, a large number of whom had lived to a great age.

The foregoing constitute most of the important contributions to our knowledge of the senile brain. Senile dementia has, of course, been studied histologically with the utmost detail by many brilliant workers, particularly Alzheimer, Simchowicz, Marinesco, Perusini, Rizzo, Uyematsu, and Grünthal.

My own contribution is based upon the histological examination of a series of 15 senile brains, at present under pursuit in collaboration with Dr. J. Godwin Greenfield, pathologist to the National Hospital, Queen-square. These brains are from individuals aged as follows: 75 (1); 80 (1); 86 (1); 90 (3); 92 (2); 93 (2); 95 (1); 96 (1); 101 (1); 102 (1); and 103 (1). In addition, we have studied the spinal cord from five octogenarians.

CRANIAL CHANGES.

The calvarium in old age is usually increased in thickness, an observation which was first made by Morgagni [175] in 1765. In the majority of cases this densification is uniform, but at times a focal osteophytic process is seen. Thus a hyperostosis of the inner table of the frontal bone is a characteristic—if somewhat rare—anomaly. According to Greig's excellent description,[30] this process starts as irregular excrescences on either side of the sagittal sulcus, midway between the foramen cæcum and the coronal suture. These multiply and, spreading fanwise, occupy most of the frontal bone, but never extend posteriorly into the parietal area. Microscopical examination reveals a thickening of the inner table, the cancellous bone becoming overlaid with compact bone which later becomes eburnated.

Numerous hypotheses have been hazarded to explain this peculiar change. Characteristically present in old age, it is much commoner among females, in the ratio of 7 : 1. Although it is often said to be unaccompanied by symptoms, Morel has drawn attention to a group of clinical manifestations which he associates with this osteophytic process. The features of the so-called Morel's syndrome will be discussed later.

Greig has suggested that intracranial hyperostosis is the result of a disuse-absorption of calcium and phosphorus salts from the skeletons of senile individuals, whose muscular activities are limited; the excretion of these salts is inadequate and there results a deposition of osteophytes. Humphry, as well as Thoma [33] and Morel, drew attention to the presence in the majority of these cases of atrophy of the cerebrum, particularly in the frontal lobes. Adherence of the meninges to the inner table will, therefore, set up a more or less constant traction upon that region of the calvarium, stimulating bone formation. In the case of isolated small exostoses, Thoma suggests that some local circulatory or nervous disorder may be responsible.

Much less frequently an atrophy of the skull bones may be encountered in advanced life, a process which was first reported by Koehler in 1768. Humphry states that all the bones of the cranium and face may be reduced in calibre and thickness. This is produced by the outer table receding and encroaching upon the diploë, so that ultimately only one brittle table is left. At other times the atrophy may be localised usually with strict symmetry to the parietal bones. The atrophic areas merge into normal bone by a gentle shelving. Several excellent specimens of this anomaly are contained in the Museum of the Royal College of Surgeons. Occasionally, the two processes of parietal atrophy and hyperostosis of the inner table may coexist. The genesis of cranial atrophy is obscure, and Humphry suggests that the pressure or traction of the occipito-frontalis tendon may be important, a view later supported by Chiari.[34]

THE MENINGES.

Alterations in the meninges are practically constant. The dura mater is almost always thickened, and in many cases adherent to the inner table of the skull. Longitudinal densifications may occur along the course of the blood-vessels. The Pacchionian bodies are often hypertrophied. Calcareous patches are not infrequent and at times areas of ossification may exist. Bony plaques are, however, less common in the cranial dura than in the spinal leptomeninges; they occur, of course, in conditions other than senility, and Leopold [35] stresses arterio-sclerosis as a causative factor.

Proliferative changes in the dura were usually described, following Carpentier and others, as chronic meningitis, and when there was an associated increase in vascularity of the tissues, the term pachymeningitis hæmorrhagica interna used to be applied. This word is rarely employed nowadays, however, and the modern description is that of chronic subdural hæmatoma. It is well known that this lesion may supervene in the aged after very slight injury; it was present in four out of the 50 senile brains examined by Campbell.[36]

The leptomeninges may also be thickened and may be œdematous in appearance. Opaque areas are common, resembling the milky patches in the pericardium. Léri, however, insists that the pia arachnoid may become thinned in old age and show numerous perforations.

Usually the meninges strip off the hemisphere with particular ease in old age, except over the occipital poles. But when foci of softening exist in or immediately beneath the cortex, an adhesion results; in cases of diffuse vascular disease the meninges may be everywhere so adherent as to leave a pock-marked surface to the cortex (= the *état vermoulu* of Pierre Marie).

The histological appearance of the meninges in old age comprises a proliferation of all elements with concomitant regressive changes. There is often a conspicuous cellular infiltration with fibroblasts, macrophages, and pigment cells. Clusters of proliferating mesothelial cells are frequently seen. The innermost layer of the pia-arachnoid may be invaded by numerous corpora amylacea, and there is often a large amount of pigment visible.

When the meninges have been stripped the brain usually shows a striking diminution in volume. The convolutions are reduced and the fissures are widened and occupied by an excess of subarachnoid fluid. Although the shrinkage is universally distributed, it is always most evident in the anterior two-thirds of the brain. Spielmeyer states that the left hemisphere is usually more atrophied than the right, but I have not been impressed by any such difference. The pons, midbrain, and cerebellum usually show a less obvious wasting, but a reduction in the size of the medullary olives is common (v. Braunmühl).[37]

SHRINKAGE OF THE BRAIN.

The consistency of the brain may be altered. At times it is described as harder than normal, but quite often—particularly when multiple vascular lesions are present—the brain feels soft to the touch.

Some index of the brain shrinkage is afforded by weighing the hemispheres. Numerous statistical tables have been compiled—by Parchappe, Huschke, Broca, Rey, Boyd, and others—which suggest that after the age of 40 or 50 there is a progressive reduction in weight. In advanced age a loss of 160–200 g. may be encountered. According to M'Gaffin[38] the reduction is greater in the female than in the male. Exceptions are numerous to the rule that the brain loses weight with increasing years, and one must remember that the cerebrum may vary considerably in normal subjects, and that the presence of vascular disease would profoundly alter the results. None of this statistical work is recent, and I know of no extensive study of the weight of the brain in advanced years, carried out with the elaborate and accurate technique of Reichardt.

The results in those of my cases where weights were noted are as follows:—

Case	Sex.	Age.	Hemisphere.		Pons and cerebellum.	Total.
			Left.	Right.		
1	M.	75	503	497	163	1163
2	M.	80	550	525	165	1240
3	F.	86	488	472	146	1106
4	M.	90	542	548	163	1253
5	F.	90	496	473	144	1109
6	F.	92	392	392	129	913
7	F.	92	450	459	127	1034
8	F.	93	408	409	145	962
9	F.	93	—	—	—	1043
10	M.	96	465	469	133	1067
11	M.	101	501	502	166	1169
12	F.	102	336	358	121	815
13	F.	103	457	462	132	1051

It must be realised that brain weights are unreliable indices of the reduction in volume, because many variable factors are present. Thus the length of time over which the brain has been immersed in fixative is important. Moreover, there may occur with advancing years an alteration in the specific gravity of the cerebral substance so that the normal standards of volume and weight no longer apply.

Further alterations are apparent when a horizontal section is made through the hemispheres. The reduction in volume is now emphasised by a dilatation of the lateral ventricles. It will be evident that the ribbon of cortical grey matter is narrowed, particularly in the frontal and temporal areas. Still greater wasting is seen in the white matter, and the distance between the cortex and the cornua of the ventricles is markedly reduced. The corpus callosum constantly shares in this atrophy.

The central grey nuclei of the basal ganglia are smaller than normal and appear compressed by the state of internal hydrocephalus. It is apparent also that the grey matter is everywhere of a slightly darker tint than usual.

Another common naked-eye change consists in numerous lacunes of disintegration scattered throughout the basal ganglia, and to a lesser extent throughout the white matter. These appear as small perforations which may be few in number or in extreme cases so numerous as to constitute a true *état criblé*.

The wall of the ventricles is often studded with small granulations and markings of various types. Four distinct kinds of subependymal change may be described: (1) *granulations* which differ from those seen in general paresis in their greater size; (2) parallel *ridging* resembling the markings on a dog's palate; (3) dead-white *plaques* recalling patches of buccal leukoplakia; and (4) circular warty *excrescences*.

Microscopical Appearances of the Senile Brain.

The histology of the senile nervous system can best be discussed along four main heads—*viz.*, changes in the nerve-cell and fibre; neuroglial alteration; abnormal depositions of amorphous material; and vascular changes.

THE NERVE-CELL AND FIBRE.

Neuronal changes consist primarily in a cell atrophy. This is of a numerical character, as the occurrence of a pure volumetric atrophy—i.e., reduction in the size of the constituent elements with maintenance of a full numerical complement, has never been proved. It is well known that with advancing years there is a generalised diminution in the nerve-cell count which is roughly proportional with age and also with the severity of concomitant mental deterioration. This diffuse cell-atrophy must be clearly distinguished from the patchy areas of atrophy in cerebro-vascular disease. This particular feature of senility has been studied statistically in both human and animal brains. Thus Ellis[39 40] has found a progressive decrease in the number of Purkinjé cells within the cerebellum after the age of 30 to 40. His own figures show that within an equivalent unit area there is to be expected at the age of 42, 823 cells; at 65, 591; at 79, 500; at 94, 462; at 100, 445. According to Inukai,[41] the number of Purkinjé cells in an albino rat 1000 days old is about 80 per cent. of the complement at birth. Harms[42] found in the cerebellum of a woman of 80 only 25 per cent. as many cells as in a young adult. Ellis says that though this cell-atrophy is a diffuse process, it is especially evident in the anterior lobe and less marked in the dentate nucleus.

A cell-atrophy is constantly present in the cerebral cortex, particularly in the frontal and temporal regions. This outfall is perhaps most evident in the third layer of the cortex, but the deepest laminæ may also show extensive atrophy. There is, however, no essential disturbance of the stratification. A similar reduction in the number of cells is found within the corpus striatum, the locus niger, and the olives.

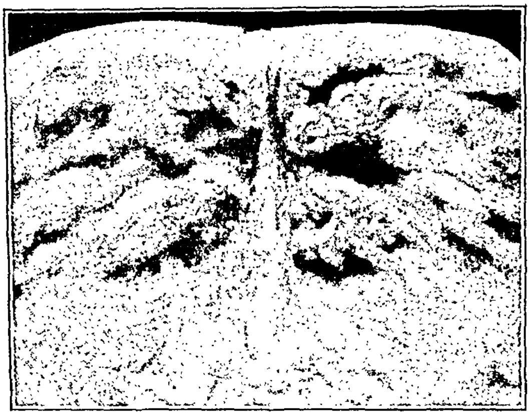
Consequent upon the outfall of neurones there is a diminution in the number of myelinated fibres revealed by shrinkage of the white matter. The dendritic processes are also reduced in number, especially in the tangential fibre layer.

Important histological changes are recognisable in the surviving nerve-cells. The neurone is usually diminished in size. Less commonly there is a process of gigantocytosis, whereby neurones attaining the dimensions of Betz cells are seen in the second and third cortical laminæ, particularly in the cornu ammonis, the hippocampus, and the frontal lobe. (Minéa [43]; Marinesco and Bistriceanu [44]). The nerve-cell is often the seat of extensive pigmentary change caused by an increase in the number of lipofuchsin granules, and also by transformation of the mitochondria. This view is supported by the work of Bertrand and Hadzigeorgiou [45] who, by their infra-red technique, found an absence of mitochondria associated with an excess of lipochrome, in two morbid conditions only—namely, amaurotic family idiocy and senile dementia.

Pigmentary surcharge is also very evident in the striatal cells and in those of the dentate nuclei. Lhermitte [46] has described, in addition, an infiltration of the Betz cells with iron in old age.

Associated with the lipoid change, and yet distinct, is a fatty degeneration of the nerve-cells. This is usually most apparent in the superficial layers of the cortex, and at times the cells are converted into sacs filled with fatty droplets. Grünthal [47] finds this type of change most marked in the cornu ammonis, and least evident in the occipital lobe. In the cerebellum fatty deposit is most obvious in the upper and outer granular layers, and occasionally in the Purkinjé cells.

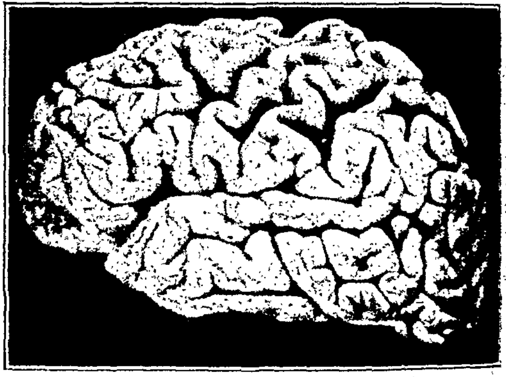
FIG. 1.



Inner aspect of the skull from a patient suffering from senile dementia, to illustrate the hyperostosis of the inner aspect of the frontal bone.

Although Vallée [48] and also Manouélian [49] have compared the type of neuronal alterations in the nervous system of senile dogs with those seen in rabies, it is the general experience that the senile type of neuronic decay is essentially different from that of toxi-infective processes. In old age the nerve-cell atrophy belongs to the so-called abiotrophic type, described by Simchowicz as "granulovacuolar degeneration." Here the cell body is small and globular with a peripherally situated nucleus; the nucleolus is deformed and may be surrounded by basophil inclusions. Later the cell shrinks to a ghost-like, shadowy area without recognisable structure. At the same time the dendrites alter, at first increasing and later diminishing in size and becoming tortuous.

FIG. 2.



Outer aspect of left hemisphere of a female (non-demented) aged 103. Weight of left hemisphere, 457 g.; right hemisphere, 462 g.; pons + cerebellum, 132 g.; total, 1051 g.

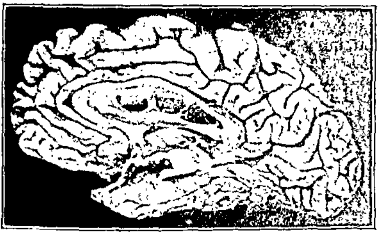
Of particular importance is the appearance of peculiar changes within the intracellular fibrillary network, first described by Alzheimer.[50] In the words of the original description ". . . . in the interior of the cell, which is otherwise normal, one or more fibrils are conspicuous on account of their special thickness and the density of their impregnation. Later, other neighbouring fibrils participate, and these form thick bundles lying in the periphery of the cell. Finally, the cell with its nucleus disappears, and the site becomes marked by a spiral-like bundle of fibrils." Every stage of this process is demonstrable, from simple intensification of the intracellular fibrils up to a mere "skeleton" composed of tangled, densely stained coils. The nature of these Alzheimer "tangles"—as they are called—was formerly under much dispute; certain histologists believed they were of neuroglial nature and situated outside the cell; to-day they are usually regarded as neurofibrillary in origin.

It is interesting to recall that Metchnikoff [51] regarded senescence as a conflict between the connective tissues (neuroglia) and the noble elements (nerve-cells), in which the former were victorious by reason of a process of phagocytosis. This, he claimed, was histologically demonstrable in the presence of macrophages surrounding and ingesting the ganglion cells. The problem was specifically investigated by Saigo [52] with entirely negative results. His experience tallies with that of all other workers, and a process of phagocytosis has never yet been demonstrated in the senile cortex.

A peculiar change in the Purkinjé cells has been described by Bouman [53] within the brains of aged subjects, particularly when mental change is present. There occurs in the proximal portion of the axons a spindle-shaped swelling of homogeneous appearance but with a peripheral net-like structure and sometimes vacuolation. Bouman speaks of these swellings as "torpedoes."

Vacuolation and degeneration may occur in the intracellular neurofibrils, forming tangled heaps. Lafora found peculiar changes in the dendrons of the cells of Ammon's horn in a senile dog; a large number of branching collaterals sprouted at a little distance from the cell body, like feathery tufts. Hortega found this change in a large number of aged animals, but discovered that it was not limited to states of senility. Prados y Such confirmed this finding in the polymorphic zone of some monkeys and regarded it as a proliferative change associated with the process of growth. Berlucchi's [54] conclusions were in general agreement.

FIG. 3.



Mesial aspect of the right hemisphere of a male dement aged 90, showing atrophy of the paracentral and fornicate gyri and gross wasting of the corpus callosum. Weight of right hemisphere, 542 g.; left hemisphere, 548 g.; pons + cerebellum, 163 g.; total, 1253 g.

In the process of disintegration the myelin sheaths become thinned and later break up into fatty globules.

THE NEUROGLIA.

Neuroglial alterations are constantly present, and proliferative as well as regressive changes may be recognised. The former comprise an overgrowth of neuroglial fibres which, though diffuse in extent, has certain sites of predilection. Thus an intense gliosis may occur in the cortex immediately under the pia and in the perivascular tissues. A reticulated appearance may result, and "monster cells" may be visible.

Gliosis in the regions of the locus perforatus posticus and lateralis may cause a shrinkage of the brain away from the basal arteries and a wide dilatation of the perivascular spaces. This change takes part in the formation of the *état criblé* in the basal ganglia and internal capsule. Holzer and also Grünthal found a noteworthy increase in the glial fibres in the white matter of the occipital lobe. A subependymal gliosis is characteristic and may be uniform or nodular, giving rise in the latter case to the subependymal granulations visible to the naked eye. There is a moderate proliferation of microglia cells with an increase in the amount of protoplasm.

Regressive changes in the glia include the appearance of rod cells, especially in the molecular layer of the cornu ammonis; lipoidal changes; Grynfeltt's mucocytic degeneration of the *oligodendroglia.* Hortega has described in the amœboid glia cells of the senile brain rolled-up glia fibrils resembling Alzheimer tangles in the neurones. The microglia cells are often altered, the nuclei being pale and swollen and often show little protuberances; the cell processes may be increased in size (Creutzfeldt and Metz).[55]

In the cerebellum the gliosis is more patchy, being restricted to the perivascular zones, the depths of the fissures, the white matter surrounding the dentate nuclei, and the regions immediately around the Purkinjé cells. Rod cells may occur in the white matter.

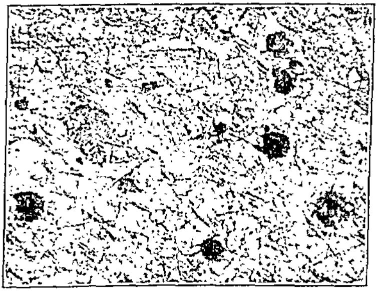
Certain authors have described "Klasmatodendrosis" or fragmentation of the neuroglial prolongations as a senile change, but Bonfiglio [56] has concluded that this is an artefact.

AMORPHOUS DEPOSITS.

The amorphous depositions which occur in the senile brain include corpora amylacea, ferruginous accumulations, and senile plaques.

Corpora amylacea, which were first described by Purkinjé in 1837, may be defined as "degenerative products of diverse form and origin, with concentric lamination, giving a typical iodine reaction" (Bertrand).[57] These appear as spherical bodies, usually stratified, measuring 15–20 μ in diameter. Each body may be surrounded by a glial proliferation. The chemical composition is believed to comprise a complex albumin with free chains which may fix molecules of sugar, calcium, and pigment. They are well demonstrated by Gram's stain and by Nile blue. Siegert [58] distinguishes two varieties: *corpora versicolorata,* giving a metachromic reaction with iodine, and *corpora flava* which responds to tests for hyaline. Amyloid bodies occur only rarely in the normal brain, but are numerous in old age. They are seen usually lying outside the nerve-cells, throughout the central nervous system, and particularly around the vessels, under the pia and ependyma, the external medullary layer of the cornu ammonis, and the fimbria. The pathogenesis is uncertain; Alzheimer, Stürmer,[59] and others regard them as "neuronic concretions," or products of cerebral metabolism, while Obersteiner and Redlich favour a glial origin. Iwata,[60] supporting the latter hypothesis, believes they are remote products of neuroglial involution, and that their presence indicates that the glia fibrils must be at least ten years old. Recent studies by Ferraro and Damon [61] suggest that the amyloid bodies are derivatives of the oligodendroglia cells.

FIG. 4.



Senile plaques in the cortex of a senile dement aged 91. Bielschowsky's stain.

Deposits of free iron are common in the brain after middle life. They occur as "degeneration bodies" in the perivascular spaces of the globus pallidus and probably arise by an unmasking of the intracellular iron normally present in that nucleus. Weston Hurst[62] regarded this change as "an expression of the proclivity of the globus pallidus to undergo degeneration in the second half of life," and this conclusion has been supported by Hadfield,[63] who believes that "pallidal siderosis is the expression of a slow evolutionary atrophy affecting the nuclei in at least 60 per cent. of people over the age of 30."

We now come to the most striking and important feature in the histological study—namely, the so-called "senile plaques."[64] Tilney has aptly referred to these formations as "the black marks of the aged brain" . . . . "the peculiar badges of old age." Their discovery dates from 1892, when Blocq and Marinesco[65] found in the cortex of an aged epileptic curious circular masses, about 60 μ in diameter, staining intensely. Other important observations followed, notably by Redlich, Perusini, and Alzheimer, and many descriptive terms were adopted. Miyake spoke of them as "glial rosettes," Léri as "sclérose névroglique miliaire"; we owe the term "senile plaque" to Simchowicz. A series of papers by Fischer[66] from 1907 to 1910 form important landmarks, and this author proposed the word "Drusen" or "drusigen Nekrosen" and also—from their resemblance to mycotic lesions—"Sphärotrichien."

Senile plaques appear as circular areas of densification scattered throughout the cerebral cortex, staining deeply with silver. They vary in individual appearance, but certain form-constants recur—viz., rings, radial figures, star-shaped structures, and circular homogeneous areas. A nuclear-like body of amorphous or cellular structure often lies in the centre. Histochemical study reveals the presence of some substance allied to amyloid, and lipoid may also be demonstrable. Macroglia and oligodendroglia are concerned in these plaques to a minor degree, but microglia cells are important constituents; neurofibrils and sometimes myelinated fibres are seen.

The topographical distribution of the plaques is of interest. They are practically confined to the cerebral cortex especially in the frontal lobe, the cornu ammonis, and the island of Reil. They have also been described in the basal ganglia and in the cerebellar cortex. The deeper layers of the cortex show the greatest number of plaques.

The important question which arises in connexion with the senile plaques concerns their association with senility on the one hand and psychosis on the other. It is indubitable that in the majority of cases of senile dementia as well as in Alzheimer's disease senile plaques occur in large numbers. Cases are encountered, it is true, in which few plaques, if any, are seen in the brains of aged individuals who are grossly demented; such instances are quite exceptional, however, and it is arguable that they might represent some peculiar clinico-pathological grouping outside the category of true senile dementia. In cases of general paralysis of the insane occurring in the aged, Prof. Jakob informs me that senile plaques occur in abundance. Plaques may occur without doubt in the brains of aged individuals who have never shown obvious mental symptoms; Simchowicz[67] believes that they are essentially associated with advanced age, but do not develop before 90; according to his view, they multiply with advancing years and are especially numerous in cases of dementia. This generalisation is acceptable on the whole, but it must be remembered that brains of extremely aged subjects have been examined without revealing plaques. Lewy[68] found no plaques in the brains of aged Turks, and even in two cases of senile dementia among Turks Schükry[69] found no plaques. This fact suggested to Spatz[70] that there may be racial variations in the degree of susceptibility to the formation of plaques. Marinesco failed to discover plaques in individuals of 99; Kuczynski made no mention of plaques in the cortex of his patient aged 118; Costantini, in the brain of a normal old man of 105, found only a few plaques; the same held true of two of my patients who were aged 101 and 103 respectively.

Verhaart[71] distinguishes "benign" plaques which provoke either no glial reaction at all or else contain healthy Hortega cells, from "malignant" plaques containing a great number of degenerated Hortega cells. The former type may be seen in mild cases of senile dementia, and Verhaart has also seen them in small numbers in the cerebrum of a normal old man of 103; the latter are characteristically present in Alzheimer's disease.

The present conception of the problem may be expressed somewhat as follows: senile plaques occur in the normal senium provided the individual had attained a very great age (? over 90); they occur very sparsely, however, so long as the mental condition is good. In cases of senile psychosis they appear at a much earlier age and may be very numerous indeed; cases of dementia in old age occasionally show no plaques, and such cases may well belong to a psychological category of their own. In Alzheimer's psychosis plaques occur in great numbers and at a relatively youthful age.

It is obvious that the problem is complex and much remains to be explained. We need more information as to the occurrence of plaques in conditions other than dementia and senility; and whether the number, size, and arrangement of the plaques bear any relationship to particular clinical pictures.

Laignel-Lavastine and Tinel[72] have described "fernleaf" argentophil depositions within the senile cortex which resemble the ordinary plaques, but differ slightly in the details of their staining reaction and physical properties. These "fatty plaques," as they were called were regarded originally as immature senile plaques and intermediate forms were described between the two types. Tinel looked upon the classical senile plaque as a "vestigial, cicatricial, and dystrophic relic" left by the reabsorption of his type of fatty plaque. The consensus of modern opinion, however, regards the latter as artefacts.

Within the cerebrum of the patient aged 118 studied by Kuczynski and Kopolowa, mention is made of albuminous depositions, reacting to some extent to tests for iron, scattered in the glial fibre layers, especially under the ependyma.

THE BLOOD-VESSELS.

The involutional changes in the blood-vessels and the lesions resulting therefrom, may be enumerated in the very briefest terms.

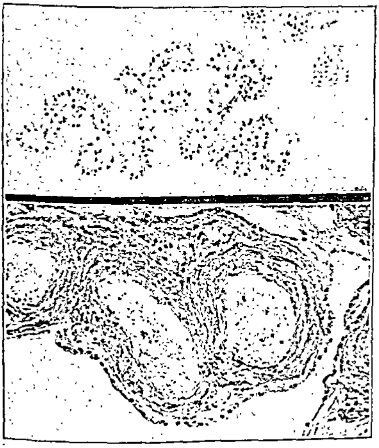
Arterio-sclerotic changes—of the type described by Allbutt under the term "decrescent"—are, of course, very commonly present. It is important to notice, however, that they may be entirely absent in a particular case. The changes when present are almost always more marked in the larger vessels of the base—i.e., the vertebral and basilar arteries and the circle of Willis.

Distinct from the lesions of arterio-sclerosis are certain minor histological alterations which must be regarded as typical of advanced life. At the present time we are engaged at King's College Hospital in a histological study of the cerebral arteries at all periods of life, with a view to determining the characteristic involutional picture. Among the commoner changes in advanced life may be mentioned: thickening of the media and intima (Triepel)[73]; hyaline changes (Klissurow)[74]; splitting of the internal elastic lamina (Hackel).[75] Deposition of iron in the adventitia and media of the pallidal arteries is of very common occurrence (Weston Hurst).

Of more particular interest are the alterations which are commonly encountered in the choroid plexus with advancing years. This, too, is a problem which is at present under investigation at King's College Hospital, and which has already been studied in recent years by von Zalka[76] and others. The more usual changes include cyst formation; proliferation of connective tissue; vacuolation and pigmentary degeneration of the epithelium; depositions of calcareous, hyaline, and psammomatous bodies.

It will suffice merely to mention the diverse effects—immediate and remote—produced by vascular disease within the nervous system, as a full description would be irrelevant. Areas of softening—of every dimension; small hæmorrhagic foci; lacunes of disintegration; the worm-eaten cortical change of Pierre Marie—these are all obvious macroscopic features. Disseminated areas of atrophy are often seen and comprise, according to Lhermitte and Klarfeld,[77] three histopathological variants—viz., reticulation, areolation, and miliary necroses. Spielmeyer[78] has stressed the occurrence of "bleaching" or cortical areas which fail to fix with various stains; it is believed that these zones represent ischæmic areas without, however, gross narrowing or occlusion of the nutrient vessels.

FIG. 5.



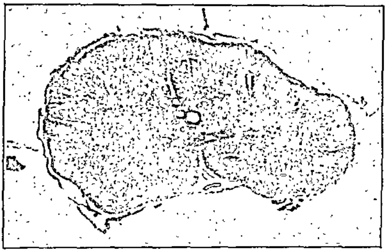
The choroid plexus in youth and old age: above, from a boy aged 11; below, from a non-demented woman of 102, showing the great proliferation of connective tissue and vascular hypertrophy.

Under the microscope a typical glial increase is to be recognised, most often perivascular in arrangement. A gliosis in the frontier between cortex and white matter is not rare, and is spoken of as the encephalitis subcorticalis of Binswanger. Various glial derivatives are encountered, such as scavenger cells and astrocytes.

Regional Pathology of the Senile Nervous System.

The foregoing description outlines the more striking changes common in the brains of folk dying at an extreme age. A short consideration may now be directed towards certain specialised regions of the brain, such as the pituitary body, as well as the spinal cord and peripheral nerves.

FIG. 6.



Trans-section of the lower cervical cord from a case of senile dementia in a man aged 82. A marginal gliosis is visible to the naked eye. (Greenfield-Mallory's stain.)

PITUITARY GLAND.

The pituitary gland, according to Lucien,[79] shows in old age no reduction in size or weight and no decrease in the parenchymatous elements, though Scheele[80] described a progressive cell atrophy and a diminution in specific gravity. Some increase in the amount of connective tissue is common, localised to the region of the hilus. Colloid—mainly of the basophil type—accumulates to a marked degree (Bolsi),[81] especially in the pars posterior (Cooper),[82] and pseudo-acinous formations are common.

THE SPINAL CORD.

The histological alterations within the spinal cord in old age have received far less attention than those of the senile brain. Although some of the earlier pathologists such as Cruvielhier, Rokitansky, Leyden (1875),[83] Demange (1881),[84] and Campbell (1894) mentioned briefly a few of the outstanding pathological changes, it was not until the appearance of Nonne's paper[85] in 1899 that a detailed study was undertaken. In 1900 Sander's important monograph[86] was published; since when Fluegel[87] (1927) has contributed to this chapter in pathology.

Meningeal proliferation may be seen around the spinal cord and calcareous plaques are not uncommonly attached to the pia-arachnoid; Sander has seen the whole cord completely encased by chalky deposits as by a suit of armour. Ossification may also occur in this situation.

The spinal cord itself may be obviously shrunken on naked-eye inspection, and on trans-section the normal contrast between white and grey matter may no longer be apparent. The more important pathological alterations within the cord are, however, microscopic in character.

Weigert-Pal's technique reveals an undue pallor which is particularly evident in the marginal zone. In some cases this process extends inwards and encroaches in particular upon the cerebellar efferents as well as Gowers's tract. Occasionally wedge-shaped areas of pallor are seen, the base of which is peripheral. Patches of perivascular demyelinisation constitute important changes, revealed by the methods of Weigert-Pal and of Marchi.

There also occurs an obvious reduction in the number of nerve-fibres, especially in the lateral and posterior columns.

Neuroglial proliferation is constantly present and always in the areas in which the myelin has degenerated. Thus the marginal zones, the perivascular areas, the lateral and posterior columns, are all the seat of a marked gliosis in which the nerve-fibres are frequently strangulated. Cuneiform areas of gliosis correspond with the demyelinated regions. The anterior and posterior commissures are also hypertrophied.

Widespread changes occur in the ganglion cells. Accumulation of intracellular pigment is constantly seen, a process which commences at one pole and later fills the nerve-cell. The nucleus stains darkly and becomes eccentrically placed; the nucleolus is angular and shrunken. Later, nucleus and nucleolus both disappear, leaving an amorphous mass of pigment. So widespread is this change that according to Sander, after 85 scarcely a normal ganglion cell can be seen. Fluegel has seen typical Alzheimer changes within the cells on one or two occasions.

The blood-vessels are also altered; their lumen may be increased but usually it is reduced or even obliterated. The vessel walls are thickened, especially the intima, and splitting of the elastica is usual. A shrinkage of the parenchyma away from the blood-vessel is often apparent, and there may be a mild perivascular infiltration with lipoid-laden cells.

Corpora amylacea are usually present in large numbers, especially near the entry of the posterior roots, along the septa and in the region of the blood-vessels. Senile plaques are rarely, if ever, present in the spinal cord.

Demange drew attention to a proliferation of the cells of the ependyma lining the central canal.

The foregoing pathological changes may exist in varying intensities, and we are told that they are not necessarily associated with abnormal clinical manifestations. Sander differentiates three varieties of pathological process within the spinal cord: (1) A slight form, characterised by a moderate and diffuse outfall of myelin, slight cell degeneration, and slight secondary glial increase. This type he associated with "physiological senility." (2) A severe form with diffuse demyelination and also focal lesions with gross neuronic decay and sclerosis. (3) A more acute type of degeneration characterised by numerous focal lesions; this variety may occur at a pre-senile age and is regarded by Sander as a form of arterio-sclerotic degeneration of the cord.

PERIPHERAL NERVES.

Still less is known about the involutional lesions of the peripheral nerves. Joffroy and Ackard in 1889 recorded degeneration of the sciatic nerves with a thickening of the vasa nervorum in a paraplegic woman of 63. Similar cases were quoted by Lorenz (1891) and by Ducil and Laury (1893). Campbell (1894) made a more detailed investigation; he found acute parenchymatous degeneration of some fibres in a peripheral nerve, and a great reduction in the number of larger axis-cylinders. Aggregations of fibrocellular débris and collections of minute nerve-fibres possessing an attenuated sheath of Schwann occupied the gaps. The peri- and epineurium were thickened and infiltrated with fat. The walls of the vasa nervorum were distinctly thickened. Both motor and sensory nerves showed these changes, especially in the more peripheral regions; the vagi in particular were severely affected.

Polyneuritis of the senile arterio-sclerotic type has also been recorded and studied pathologically by Schlesinger (1895)[88] and Franceschi (1903).[89]

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THE ADEQUATE TREATMENT OF SYPHILIS.

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IN the article entitled The Modern Treatment of Syphilis in the *Practitioner* for February, 1931, Colonel L. W. Harrison rightly states that "a question of considerable importance is whether, in early cases, bismuth or mercury should be given concurrently with (*i.e.*, in the same course as) the arsenobenzene compound." He is convinced that in early cases concurrent treatment should be adopted; and he gives reasons for his belief. Whether these reasons are good and sufficient is another matter. He is, furthermore, of the opinion that "those who are now treating their early cases on the plan of alternating courses of arsenobenzene with courses of Hg or Bi are laying up for their patients a heritage of neurosyphilis."

The last statement is very plain and very definite. Such an opinion, coming from so high an authority, is one to which much heed must be given, and one which must cause those who advocate the alternating method furiously to think. If Colonel Harrison's view is correct, then it is time indeed that the principles held by the alternating school were discarded for ever. If, on the other hand, he is wrong, then it is equally necessary that his error should be *demonstrated*.

While no scientific authority claims to be infallible, yet such is often practically assumed, acted upon, and adopted as a doctrine, by those who have hitched their wagon to that particular scientific star. The position of an individual may be so high that there is a distinct tendency for those who are his disciples to give an ex-cathedra value to all his opinions upon his special subject—to accept them without question, and to stigmatise as heretical any views to the contrary. The great John Hunter, by virtue of the high position he occupied in the medical world of his time, fixed upon venereology for many decades the error that syphilis and gonorrhœa were one and the same disease. Those who, like Benjamin Bell, held the diametrically opposite view, were regarded as scientifically lost souls. The authority of Hunter and his misinterpretation of his own ill-conceived and unfortunate personal experiment, completely eclipsed clinical experience and the more numerous and more scientific experiments of the comparatively obscure Bell.

To one who was originally of the concurrent school, but who for the last ten years has consistently advocated the alternating method, the statement by Colonel Harrison that such a method is a sure receipt for the manufacture of neurosyphilis is of the nature of a challenge which must be taken up. With my provincial rushlight I teach, and try to show, that arsenobenzene and bismuth should *never be given concurrently*; and since many of those whom I teach, and whom I have taught, will read Colonel Harrison's recent article, I am compelled without delay to present the other side of the case.

Reasons for the Alternating Regimen.

The main reasons why I adopt and teach the alternating method are:—

(1) Under the concurrent regimen, when arsenobenzene and mercury were exhibited simultaneously,

it was found—in my former experience—necessary to interrupt treatment after the first eight or ten weeks in order to prevent the patient showing signs of intolerance. During the treatment period approximately 4·65 g. of arsenobenzene compound (Ab.C.) and grs. 8 of mercury were given. This was not enough to cure the patient; and yet an interval of from two to four weeks had to be allowed in which no therapy was given, so that the patient could recover from the toxic effects of the remedial agents administered. During this time the parasite was permitted, unmolested, to entrench itself in deep-seated visceral structures, chiefly in the cardiovascular and central nervous systems. It therefore seemed to me more in accordance with common sense to try to arrange therapy so that rest-periods were abolished, and so that the parasite would be continuously subjected to an intense chemotherapeutic bombardment. This could only be done by exhibiting the drugs in alternate courses.

(2) It was found that under concurrency there were many patients who developed jaundice, nephritis, and exfoliative dermatitis. This was considered to be due probably to the double assault upon the hepatic, renal, and cutaneous systems. On changing over to the alternating system, the incidence of these complications almost reached vanishing point—especially nephritis. Jaundice and dermatitis became exceedingly rare and were only found in those cases who had apparently an idiosyncrasy to the drugs. In the few cases of jaundice which did occur, the condition could, in a large proportion, be attributed to causes other than therapy; and in every instance the type of jaundice was much less severe than formerly. Furthermore, it was found that, more often than not, after the condition had cleared, alternating therapy could be resumed without any recurrence taking place.

(3) Under the concurrent method many patients were found to have become drug-resistant or Wassermann-fast. This was thought to be due to the *Treponema pallidum* having developed an immunity to the action of the remedial agents. Akatsu and Noguchi[1] and also Klauder[2] showed experimentally that such resistance could take place. It seemed natural, therefore, to reason that it would be better to administer the drugs in separate series so that no sooner was the parasite threatening to develop a resistance to one agent, than a new weapon was brought into action; and when the efficacy of that began to wane, a change was made back to the original one—or to another new one if such were available. Experience has shown this reasoning to be correct, for, since the adoption of the alternating method, drug-resistance and Wassermann-fastness have ceased to appear as practical difficulties.

(4) A study of the mode of action of Ab.C. and of Bi—for mercury has been discarded as being inefficient and a mere waste of time—also forced me to give up concurrent treatment. Ab.C. and Bi do not act directly upon the parasite. When injected into the body they stimulate the tissues to produce toxalbumins—conveniently termed *arsenoxyl* and *bismoxyl* respectively—which are lethal to *Tr. pallidum*. In other words, the Ab.C. and the Bi are the raw materials supplied to the body-factory which produces the finished article capable of destroying the parasites. The manufacture of these proteo-arsenic and proteo-bismuth combinations inevitably throws some strain upon the producing-tissues of the patient. Where the two raw materials are exhibited simultaneously, twice the load is cast upon the productive mechanism than when only one is given. The tissues are thus, under concurrency, more easily exhausted, and finally cease altogether to produce the lethal toxalbumins. Thus we have another cause for drug-resistance and Wassermann-fastness.

By the alternating system this tissue exhaustion is prevented. The body is not overworked; and so the machinery is not so liable to break down. Before the production of arsenoxyl threatens to peter out, the Ab.C. is withdrawn, and another raw material in the form of Bi is introduced for a different class of machinery to work upon.

(5) Many cases, which formerly had become Wassermann-fast under concurrency, have been treated during the past ten years by the alternating method. A large proportion of these as a result became permanently negative.

Therapeutic Economy.

(6) Under the alternating method there is a saving in time and of the amount of remedial agents necessary to cure a case of early syphilis, say, in the sero-negative primary stage. For example, the course for such a case which is routine at Salford Municipal Clinic reads:

	Ab.C.	Bi.
Stabilarsan once weekly for 6 weeks ..	3·45	—
Bivatol twice ,, ,, 4 ,, ..	—	0·64
Stabilarsan once ,, ,, 6 ,, ..	3·45	—
Bivatol twice ,, ,, 4 ,, ..	—	0·64
Stabilarsan once ,, ,, 6 ,, ..	3·45	—
Total 26 ,, ..	10·35 g.	1·28

There have been analysed some 136 cases of sero-negative primary cases who have completed the above course according to the time schedule and during a period not exceeding 30 weeks. The majority of these were treated with bismuth preparations other than bivatol which has only recently been introduced. These have been under observation for periods of from three months to five years. In no instance has there been any clinical or serological relapse. Upon the above course the cure-rate is 100 per cent. for sero-negative primary syphilis. The expenditure is 26 weeks of time, 10·35 g. of Ab.C. and 1·28 g. of metallic bismuth contained in a bismuth compound—in this case, bivatol.

Now, the St. Thomas's minimum treatment prescribed for sero-negative primary cases consists of three courses as laid down by Colonel Harrison (loc. cit.). The first course may be tabulated thus:

Weeks.	Days.	Grammes.		Weeks.	Days.	Grammes.	
		Ab.C.	Bi.			Ab.C.	Bi.
1	1–7	0·45	0·32	11	71–77	—	—
2	8–14	0·45	0·32	12	78–84	0·90	—
3	15–21	0·60	0·32	13	85–91	0·90	—
4	22–28	—	0·32	14	92–98	—	—
5	29–35	—	0·32	15	99–105	—	—
6	36–42	—	0·32	16	106–112	0·90	—
7	43–49	0·75	0·32	17	113–119	0·90	—
8	50–56	0·90	0·32				
9	57–63	—	0·32				
10	64–70	—	0·32		Total..	6·75	3·20

An interval of six weeks is now allowed to elapse and the course is repeated. Another rest-period of six weeks then occurs, and again the course is gone through. The total time taken is thus 63 weeks, during which 20·25 g. of Ab.C. and 9·60 g. of bismuth metal are given. The two courses may thus be compared:

St. Thomas's ..	63 weeks	20·25 Ab.C.	9·60 Bi.
Salford	26 ,, ...	10·35 ,, ...	1·28 ,,

The Salford course thus shows a saving of 37 weeks, of 9·90 g. of Ab.C., and of 8·32 g. of metallic bismuth. The cure-rate is the same for both courses.

As I pointed out in the *British Medical Journal* for Feb. 21st, 1931, the method of computing therapy in terms of quantity given—Ab.C. in one case and Bi metal in the other—is practically meaningless, and does not permit of comparison between different courses to be made. Reckoning the therapy in terms of therapeutic units based upon the chemotherapeutic indices of the agents used, and taking into account the two-dimensional time-quantity factor, we find that during the 63 weeks of the St. Thomas's course (assuming that the therapeutic unit value of the bismuth is 0·75) in all 49·5 therapeutic units are given. In the Salford course, on the other hand, 24 therapeutic units are given in 26 weeks. The respective efficiency indices of the two courses therefore are:

$$\text{Salford E.I.} = \frac{24 \times 100}{26} = 92 \text{ (approx.)}$$

$$\text{St. Thomas's E.I.} = \frac{49{\cdot}5 \times 100}{63} = 79 \text{ (approx.)}$$

There thus appears to be a balance of 13 points in favour of the alternating Salford course. The end-results may be equally good, but the St. Thomas's course occupies an additional 37 weeks and requires 25·5 more therapeutic units. The latter must therefore be more prone to cause defaulting—i.e., uncured syphilis—because patients are more likely to attend regularly for 26 weeks than for 63 weeks. The St. Thomas's course is less economical, in so far as to get equal results a greater quantity of remedial agent is required. And apparently, since rest-periods are so necessary, it is more productive of toxic effects. During these periods, as has been already indicated, the parasite is free to do what damage it can.

Neuro-recurrence.

A great deal has been made of the alleged frequency of neuro-recurrences under the alternating method as contrasted with their rarity where the concurrent principle is adopted.

Working under the former method, my experience is identical with that of Colonel Harrison who proceeds on the concurrent principle—namely, that I have not yet seen a case of clinical neuro-recurrence. In this respect then there is no difference between the two lines of treatment.

Colonel Harrison quotes Moore and Kemp's[3] analysis of cases treated on the alternating plan at the Johns Hopkins Clinic. Out of 402 cases of early syphilis these workers found 59 relapses of a neuro-recurrent nature. What Colonel Harrison fails to explain is that all of the 59 cases who relapsed received utterly inadequate treatment, and that of the 71 patients who completed their course according to the schedule laid down by Moore and Keidal,[4] in no single instance did a neuro-recurrence or other relapse take place. In other words, neuro-recurrence only happened among early defaulters. It is a striking thing that in this Salford Clinic the experience is that even among defaulters under our alternating regimen neuro-recurrence has not yet been recorded. One factor in producing this type of relapse in America may be racial difference. I am more inclined to think, however, that the incidence in Moore and Kemp's series is more likely to be due to the use of 606 instead of 914, and of mercury instead of bismuth. There is much to support the belief that while 606 has a more powerful effect upon the parasites in the cutaneous structures than has 914, it has at the same time a greater traumatic toxic effect upon nervous tissue. Trauma forms a locus minoris resistentiæ, and so it is that the undestroyed parasites in the defaulter's body settle down in these damaged areas and give rise to neuro-recurrences. The 914 preparations, on the other hand, do *not* cause this nervous system damage, hence patients *treated* by such compounds are not so prone to neuro-recurrence. The relative potency of bismuth *in the form* of bivatol to mercury is as 12 is to 1, so that here is a very patent reason why neurological and other relapses are more likely to occur when mercury is used in preference to bismuth.

Another point of great importance is illustrated by the Moore and Kemp analysis, and it is that while the striking feature of the 59 cases was the inadequacy of the treatment given, all the *neuro-recurrences* happened within the first year, and *in* 97 per cent. within the first six months. The average lapse was only 2·7 months. Moore and Kemp state:

> "That precocious neurosyphilis can develop under these conditions is one of the strongest arguments for the continuous treatment of early syphilis. After once beginning treatment it is absolutely unsafe to permit a patient with primary or secondary syphilis to pass a single day without the influence of a treponemicidal drug."

As will be seen from an examination of concurrent schemes of treatment, continuous therapy is impossible because rest-periods are absolutely necessary. In the St. Thomas's course there is a no-treatment gap during the eleventh week, and a fortnight's interval during the fourteenth and fifteenth weeks. In addition there are the two intervals of six weeks each between courses—making 15 weeks in all during which nothing whatever is done.

Those who examine the St. Thomas's course might be tempted to ask: If concurrency is so right and alternation so utterly wrong, how does it come about that in this course *concurrent treatment is only given during five out of the 14 weeks of actual therapy?*

Effect of Combining Bismuth and Arsenic.

With respect to Kolmer's[5] paper on Bismarsen, it is stated that "while the arsenical content of 606 is 2·4 times greater than that of bismarsen, its trypanocidal activity is only twice as great, although bismuth alone is without trypanocidal activity." This is somewhat obscure; and it might not seem terribly wrong to some to interpret this as meaning that since the arsenical content of 606 is 2·4 times as great, while its trypanocidal power is only twice as great as bismarsen, the latter is thus of lower value than the former, and that this is due to the combined bismuth. It might be argued that so far from there occurring a summation of the respective activities of arsenic and bismuth, there is, when they are combined, actually a decrease.

There is, moreover, a serious fallacy in Colonel Harrison's—or is it Kolmer's?—argument. He clearly premises that trypanocidal and treponemicidal power increases directly with the arsenical content of the compound. From that he argues that since the arsenic content of 606 is 2·4 times greater than that of bismarsen, the therapeutic activity of the former should also be 2·4 times greater than that of the latter; but, since it is only twice as great, therefore the addition of bismuth to the latter has increased its therapeutic value. The fallacy lies in the assumption that the greater the metal content the greater the curative value. Such, however, is not the case either in respect of arsenical or of bismuth compounds. All that Kolmer's work shows is that the bismuth—which is inert as a trypanocide—has the effect, by some physico-chemical means, of making the arsenic more usable for the production of arsenoxyl. Bismuth and its compounds, it is true, have little or no effect against trypanosomes; but, as is well known, agents which may be quite devoid of trypanocidal activity may have a remarkably high treponemicidal value. It was pointed out a long time ago that trypanocidal tests are only of value so far as organic arsenicals are concerned in the chemotherapy of syphilis.

With respect to bismarsen, it is important to consider the experience of O'Leary.[6] The acute signs of syphilis were slower to disappear than under arsphenamine, and so likewise the treponemicidal effect was less rapid. O'Leary records severe exfoliative dermatitis, and Schoch[7] mentions a similar occurrence with bismarsen. This condition developed after 14 injections of 0·2 g. twice a week by the intramuscular route. Kolmer states in his communication that in four cases of primary syphilis 0·2 g. of bismarsen caused the treponemata to disappear in from 36 to 120 hours. The lesions themselves, however, vanished more slowly than is usual after the intravenous injection of 606 or 914.

It is difficult to see from all this where the advantage of this combined arsenic and bismuth compound comes in.

There is no doubt, however, as was shown by Lehnhoff-Wyld,[8] that the addition of certain other metals to an arsenobenzene compound increases the "usability" of the arsenic. But Lehnhoff-Wyld found that the metal which gave the highest degree of enhancement was zinc, which by itself has no treponemicidal power. It is a matter of opinion whether it is necessary or advisable to raise the treponemicidal power of the arsenobenzene with the risk of increased toxicity and so on; but in any case, if it is so desired, there is no objection to the use of another metal provided it has no treponemicidal effect of its own, has no similar tissue reaction to that of arsenic or bismuth, and does not cause any great extra load to be thrown upon the eliminatory mechanism.

In my view, whatever metals are used in conjunction with arsenic or bismuth, they should not be members of Group V. of Mendelieff's periodic table. I have no insuperable objection to the concurrent use of Ab.C. and Hg because, whatever infinitesimal treponemicidal power the latter may possess, its mode of action upon the parasite differs radically from that of arsenic and bismuth. The Hg may make the arsenic more usable, and similarly with respect to silver-salvarsan. But after a combined course of Ab.C. and Hg—the latter being regarded as an enhancement for the arsenic and not as having a therapeutic value of its own—there should follow a series of bismuth injections alone, and so on in the alternating fashion. The concurrent school must finally accept the principle that, if they are correct, there is no limit to the number of treponemicidal agents which can—and ought—to be exhibited simultaneously. Thus, if compounds of the other members of Group V. of the periodic table—phosphorus, vanadium, niobium, antimony, tantalum, &c.—are synthetised and possess safe chemotherapeutic indices, they should all, according to the advocates of concurrency, be given together. Why is it that even those who still believe in mercury do not give Ab.C., Hg, and Bi simultaneously?

The alternating school will, if and when such compounds become available, exhibit them in successive series of injections, utilising those earliest and by preference which have the highest chemotherapeutic indices.

I do not say that the advocates of concurrency are utterly and irrevocably wrong—because syphilis can be cured not only by the simultaneous giving of divers remedial agents, but even by the exhibition of only one. But what I do submit is that concurrency, like monotherapy, is essentially unsound, that it is much more dangerous, is less successful, is more wasteful of time and material, and is therefore productive of a greater number of defaulters—uncured syphilitics—than is the alternating system.

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BLOOD CULTURE IN TUBERCULOSIS

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The growth of tubercle bacilli on artificial med has always presented difficulties. Many metho have been advocated but have been too complicat to be of use in the ordinary work of a laborator Further, in animal experiments when tuberculo material has been injected into guinea-pigs, t animals may die from secondary infection or sho before the tubercle bacilli can establish their typi lesions.

Although cultures have been obtained fr sputum and caseous material, bacilli have on rarely been grown from the blood stream. Recent however, Löwenstein and Reitter have publishe one of many instances in which they have succes fully cultured tubercle bacilli from the blood, a since seeing their paper I have investigated cas of suspicious and established tuberculosis for t existence of a tuberculous bacillæmia. I ha repeated Löwenstein's experiments, and in t following note I propose to give an account of t technique employed and of the results obtained.

Löwenstein's Egg Medium.

This medium offers but one difficulty in its p paration—that is, the exclusion of moulds a contaminating organisms. By slightly modifyi Löwenstein's apparatus I suggest this shortened a simplified technique.

1. Three newly laid eggs are thoroughly cleansed w cotton-wool saturated in methylated spirit.
2. The top and bottom of each egg is pierced with sterile scalpel, and pieces of the shell removed with ste forceps, allowing the contents to fall into
3. A stout glass bottle containing 2 oz. of small gl beads. (It is essential that all glassware and instrume should be thoroughly sterile.)
4. A well-fitting stopper is inserted into the bottle a the contents are shaken by rotary movement for three four minutes.
5. The egg mixture is transferred to a graduated cylin and one-third of its volume of
6. 5 per cent. glycerin broth is added (pH 6·8).
7. By means of a separator 5 c.cm. of this mixture is r into test-tubes.
8. These tubes are inspissated at 84° C., and when t medium has set they are left to stand upright in racks.
9. To each tube 1 c.cm. of broth is added (pH 6·8) means of a graduated pipette.
10. The test-tubes are capped and incubated for 48 hou

Tests of the Efficacy of the Medium.—Fourteen spu were examined, in five of which tubercle bacilli we seen in direct smears, and these all grew colonies visil

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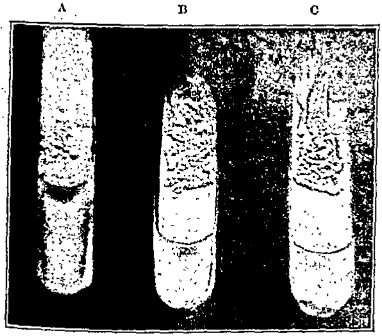
[1] Löwenstein, E., and Reitter, O.: Münch. med. Woc Feb. 13th, p. 261.

to the naked eye by the fourteenth day; of nine in which no tubercle bacilli were found in direct smears, one grew a pure culture in 17 days, eight remained sterile.

2 c.cm. of sputum were shaken with 10 c.cm. of 10 per cent. sulphuric acid in a stout glass test-tube containing five or six beads. After 20 minutes of occasional shaking, the emulsion was centrifuged and the supernatant fluid decanted. The remaining sediment consists of a layer of disintegrated lung tissue, and below this, a layer of amorphous debris. By means of a wide pipette the layer of lung tissue was transferred on to the egg medium (see Figure and tube A). By means of a large platinum loop the underlying layer of debris was inoculated in two other tubes (tubes B and C).

On the eighth and ninth days, although macroscopically there was no growth detectable, stained preparations showed massive colonisation. In the illustration tube A demonstrates how the lung tissues hinder the growth of the colonies, and tubes B and C show the freer growth from the amorphous debris.



Three tubes showing growth of tubercle bacilli on Löwenstein's culture medium under conditions explained in the text.

In recovering organisms from urine sufficient urine is centrifuged to obtain 2 c.cm. of sediment, which is then shaken with 15 per cent. sulphuric acid. Lieberthal[2] reports on numerous cases in which, when using this medium, tubercle bacilli had grown on the tenth day, whereas with the old potato medium three to five weeks were required. Pus, cerebrospinal fluid, and pathological tissues (the latter having been first pounded with 10 per cent. sulphuric acid) have all given pure cultures of tubercle bacilli on the egg medium.

Blood Culture.

Variations have been made in the technique for culturing the tubercle bacilli from the blood. The principles laid down by Lichtenstern[3] have mainly been followed.

Technique.—Under sterile conditions—

1. Mix 10 c.cm. of blood (obtained from a vein) with 3 c.cm. of 10 per cent. sodium citrate.
2. Centrifuge, decant the supernatant fluid.
3. Hæmolyse the red blood corpuscles with 5 per cent. acetic acid.
4. Centrifuge, discard the supernatant fluid.
5. Wash the sediment with distilled water and centrifuge (twice).
6. Decant supernatant fluid and transfer the whole of the deposit by means of a wide capillary pipette on to Löwenstein's egg medium.

Control Experiment.—A heavy suspension of human tubercle bacilli, obtained from a culture grown from sputum on this medium, was added to citrated blood and subsequently treated as above. Colonies were visible on the sixth day. This very early growth can be accounted for by the acclimatisation of the bacilli to their artificial medium.

So far, out of 11 cases under investigation, I have only succeeded once in a case of tuberculous bacillæmia in culturing the tubercle bacillus direct from the blood. The case was as follows:—

Male, aged 27, admitted April 5th, 1931, to the French Hospital under Dr. Campbell McClure. Clinical diagnosis: Bronchitis and pleurisy without effusion. Several smears from sputum, negative. Blood culture in trypsin broth, negative. Blood culture on egg medium gave growth of tubercle bacilli in 16 days. The blood, cerebro-spinal fluid, urine, and sputum were examined cytologically and by cultures with negative results. The patient is still under observation, and cultures on egg medium have been made from blood, urine, and sputum to check these results.[4]

I believe this to be the first case of tuberculous bacillæmia recorded in this country in which tubercle bacilli were found in cultures as early as the sixteenth day.

It seems possible that with this method of culturing tubercle bacilli from the blood many cases of undiagnosed pyrexia and doubtful skin lesions will be recognised as tuberculous, and that earlier diagnosis will be obtainable. It is maintained by most authorities that a bacillæmia is precedent to any localised tuberculous focus. Blood culture may make it possible to ascertain the presence of an active or quiescent tuberculous lesion.

I have to offer my thanks to the French Hospital, to Dr. E. ff. Creed, of King's College Hospital, for giving me every facility and encouragement in carrying out these investigations, and in particular to Dr. K. E. Eckenstein, honorary pathologist and physician to the French Hospital.

CONSTITUTIONAL ANGIOHYPOTONY,

OR IDIOPATHIC PERMANENT ARTERIO-HYPOTENSION.

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DURING the last 15 years there have appeared in the international medical literature a series of articles on a certain morbid condition that every author calls by a different name. The most important of these names are: hyposphyxy (Martinet, 1918), particular symptomatic triad (Vincent, 1918), arterial hypotony (Fritz Weiss, 1927), permanent arterial hypotension with an idiopathic course (Lian and Blondel, 1928), insufficiency of tension (A. Dumas, 1928), hypotension, (Garin, 1927, A. Strasser and W. Loewenstein, 1929), habitual hypotony (Jimenes Diaz), and low arterial tension and hypotony (Franz Kisch, 1929). One result of this multiplication of nomenclature has been that the identity of the phenomena described has escaped the observers. I was the first to describe this morbid picture, in a series of papers[6] beginning in August and September, 1903, when I gave it the name of "chronic arterio-hypotension," though later I preferred "constitutional angiohypotony."

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[2] Lieberthal, F.: Surg., Gyn., and Obst., 1930, i., 985.

[3] Lichtenstern, R.: Münch. med. Woch., March 20th, p. 471.

[4] Since writing the above a scanty growth of tubercle bacilli has been obtained from sputum which was incubated on April 16th. A diagnosis of tuberculous peritonitis has been established clinically, and it may therefore be concluded that the patient had a primary focus in the lung and that, during seven weeks of pyrexia (temperature 101° to 103° F.), a dissemination of the bacilli in the blood stream occurred.

The outstanding features of the condition I described were:—

(1) Signs of lack of tone in the arteries and veins without any corresponding lack in the heart, which in some patients and at some stages is over-excited.

(2) Severe disturbance in the blood-supply and nutrition of the organs, especially the nervous system, kidneys, and liver.

(3) Sclerosis in the walls of the vessels, indicating the dystrophy and intoxication caused in their metabolism by the hypotony.

(4) General weakness, often combined with attacks of hyper-excitability; fits of vertigo; accentuated first sound in the mitral area and accentuated second sound in the aortic area due to over-excitability of the myocardium; a tendency to displacement of the heart; acrocyanosis without general stasis; a tendency to visceroptosis; hæmorrhoids; oliguria; hæmaturia; albuminuria; and the passage of casts.

(5) General alteration in the appearance and indication of the influence of general angiohypotony on the development of the body and the general metabolism.

It is possible to confuse the diagnosis with mitral stenosis and mitral inefficiency. The morbid picture originates from abnormal constitutional conditions, depending on intoxications and infections that have acted either in utero or during the first years of life, exerting a secondary influence on the organs regulating the development of the body generally and of the vascular tissue in particular, especially of the adrenals, pituitary, and thyroid.

I recommended dietetic, balneological, climatic, and endocrine treatment to tone up and detoxicate the walls of the vessels and the whole organism.

This abnormality in the function of the blood-vessels can induce a vicious circle and disturb the whole organism, beginning with the heart. I regard it as a general and local biological disturbance and not as a simple mechanical trouble, and this interpretation has explained as angiohypotonic a number of syndromes previously described under different names, such as congenital heart disease, hypertrophy of the heart, irritable heart, neurasthenia of the heart, and "effort heart."

Pagès[1] wrote in 1929:—

> "en la matière le professeur A. Ferrannini n'a pas été seulement un précurseur, mais véritablement un novateur"; "il peut à bon droit en revendiquer la paternité"; "il s'agit d'une consécration trop tardive d'un exceptionnel mérite." "Peut-être pourrait-on le consacrer d'une façon plus éclatante en désignant le syndrome d'angiohypotonie du nom de syndrome de A. Ferrannini."

Subsequent descriptions of the syndrome do not differ from my original picture, although naturally, since I first wrote, clinical and endocrinological knowledge has greatly progressed, and later observers have had the opportunity of noting phenomena which the laboratory technique of the time did not allow me to mention in my first articles.

In August, 1903, I showed that patients suffering from constitutional angiohypotony have a functional insufficiency of the adrenal capsules and the sympathetic nerve-supply, as a symptom of endocrine disturbance. Before that time neither Sergent nor Vaquez had studied disorders of the sympathetic and adrenal systems in chronic vascular abnormalities. The injection of the adrenal hormone as a means of investigation has been employed by various investigators recently in a study of the functional condition of the vessels; I used this method in July and August, 1911.[2][3][4] Laignel-Lavastine's observations only date from 1908, five years after my first articles.

The term "angiohypotony" indicates that the disorder is primarily to be found in the walls of the vessels, rather than in the heart and defines that disorder as a lack of tone. "Hypotension" and "arterio-hypotension" do not explain whether the hypotony depends on the heart or on the vessels. There is undoubtedly a constitutional or congenital tendency, and quite a number of observers have preferred to use the word "constitutional" in their title for this condition. Bishop in 1904 wrote of "constitutional low tension," and Garan in 1907 described six cases of hypotension in one family. At the meeting of the Medical College of Vienna in November, 1926, H. Kahler pointed out the underlying constitutional abnormality and lack of vascular tone in cases of variable blood pressure and arterio-sclerosis in youth. Prof. Ludwig Braun,[5] writing under the title "Konstitution und Kreislauf," lays emphasis on the importance of the general constitution in circulatory abnormalities.

Certain difficulties arise in the recognition of this constitutional picture. The first is the clinician's habit of mind; he is so accustomed to regarding arterial hypotension as a result of myocardial insufficiency that he automatically looks to the heart whenever he meets a case. A patient with arterio-sclerosis may have his heart in excellent condition and yet have a very low tension in his vessels, as I showed 30 years ago when I had the privilege of converting Henry Huchard, the chief exponent of the view that it was impossible to have arterio-sclerosis without angiospasm. Another difficulty arises from the presupposition which accepts angiospasm as a cause of hypertrophy of the myocardium but does not realise that enlargement of the vessels may also call for increased effort on the part of the heart. With modern instruments for clinical and laboratory work it is possible to bring experimental exactitude to studies at the bedside, and this difficulty ought easily to be overcome.

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CHRYSANTHEMUM DERMATITIS.

By G. S. Nightingale, M.R.C.S. Eng.,
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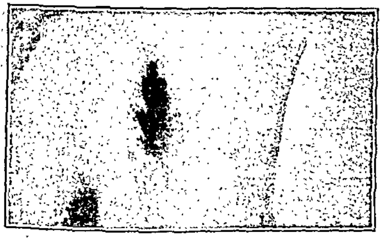
That certain people are supersensitive to chrysanthemums is vaguely recognised by the profession, but not by horticulturists, and the condition is rare enough to be worth recording.

Case Record.

A market gardener, aged 54, gave the following history. Twenty-five years ago, after having worked amongst plants, including chrysanthemums in season, for seven years, he noticed outcrops of small pin-head vesicles on the backs of his hands and on his wrists after contact with chrysanthemums. This later changed to a dry erythema, and was very irritable. The next year (24 years ago) a patch of "eczema" occurred on his left forearm where the plants lay as he carried them; this spread to his face, which also became swollen. Since then, each year about October, similar lesions have appeared, becoming gradually worse each season. At first only some varieties of chrysanthemum affected him, notably those with the strongest smell, but more recently all varieties have had the same effect, and latterly even the handling of the roots has been sufficient to bring on an attack.

Once, on the advice of a doctor, he obtained work where none of these plants was grown, and had no trouble, but on returning to chrysanthemums he relapsed. The present season's attack started in early October, 1930, on his hands and face, and then spread to his forearms and legs. Irritation was severe. No other plants are known to affect him, and no member of his family is similarly affected. He does not suffer from asthma or hay-fever.

He was admitted into the London Hospital under Dr. W. J. O'Donovan on Dec. 31st, 1930, when he presented the following picture. He was a well-built man, healthy apart from pyorrhœa alveolaris. The skin of his face was dry but no swelling was seen. His hands and forearms showed sheets of dry scaly lichenised papular erythema, with a few scattered relics of small furuncles. His legs were eyrthematous and excoriated on both shins. No other abnormalities were seen, and his blood count was normal except for a 10 per cent. eosinophilia; his blood pressure was 150/95 mm. His condition improved after the application of a 1/3 S.B. dose of X rays to all his lesions, and the administration of protein shock with T.A.B. 1/8 c.cm. intravenously (800 million bacteria), which gave rise to a temporary pyrexia of 103° with a rigor. Locally, glycerin of lead lotion with acid carbol. liq. 1 in 60 eased the irritation.



Localised erythema produced by experimental application of a chrysanthemum leaf to the skin of the back for 24 hours.

To test the sensitivity of his skin, a piece of chrysanthemum leaf was strapped on to his upper arm for 24 hours, with a tulip leaf as a control. Leaves from the same plants, chrysanthemum and control, were also applied for a like period to the arms of two controls, one of them a patient with cheiropompholyx, who might, a priori, be expected to be supersensitive to external irritants. After 24 hours the market gardener showed a close-set vesicular eruption on an erythematous base on the exact area covered by the chrysanthemum leaf, and a scarcely noticeable erythema on the site of the control leaf. Neither of the two control subjects was affected by either leaf.

This leaf reaction was repeated on the patient with other control leaves on different skin areas with similar results. The one pictured was photographed approximately 72 hours after application. The lower surface of a leaf gave a much stronger reaction than the upper, and a petal similarly applied gave a local erythema without vesiculation. In each case the reaction developed into an area of dry, slightly scaly, crusted erythema similar to his original condition, without the lichenisation due to long-continued scratching. The lesions persisted as a scabbed erythema for over four weeks after contact. Three extracts were made from crushed chrysanthemum leaves, and were painted on to his skin. An alcoholic extract, and one made by soaking the leaves in normal saline for 24 hours, produced no skin reaction. An etheric extract, on the other hand, produced, after 24 hours, a slight erythema. His normal reaction time before the appearance of a rash was about 12 hours, this being accounted for by Smith[1] as the time taken by the irritant juices to penetrate the skin; it may, however, be merely the latent period to be observed in many exogenic skin affections (vide *Brit. Jour. Derm.*, 1920, xxxii., 223).

This reaction time can be influenced by X rays. A three-inch square was marked out on his back and subjected to a 1/3 S.B. dose, the surrounding skin being screened by a double layer of lead and rubber. Four days later, leaves were applied to this area and to adjacent normal skin. The reaction time was nearly doubled in both cases, and neither developed beyond a slight erythema with a few vesicles, the rayed area being slightly less marked. This experiment was repeated with the same result later. In no case did the reaction develop into the close-set vesicular eruption previously noted. From this it appears that the rays have at least a temporary effect upon the sensitiveness of the skin, both of the rayed area and of that surrounding it.

Discussion.

References to this condition, beyond mere mention, are not numerous. The London Hospital skin department has records of two cases, with photographs: one was a nurseryman in 1924, who had a dermatitis of his hands traceable to these plants; the other, in 1926, was a chrysanthemum specialist who for 15 years had an autumnal rash on his face described as a "sore, smarting, confluent erythema and thickening of the skin, with swelling round his eyes."

Prosser White[2] says that only certain chrysanthemums are irritant, and that these are used for making insect powders, the manufacture of which is sometimes attended by a mild dermatitis. Darier[3] also states that only certain varieties are irritant. Dawson[4] reports a case of a gardener on whose face an acute dermatitis appeared a few hours after contact with chrysanthemums, but which always cleared up over the week-end when he was away from work; his hands were never affected. Broers[5] states that chrysanthemum dermatitis was first reported by Howe in 1887 (I have not been able to trace this reference). He quotes Dawson's case in 1908, and says that in 1927 Kren noted a hypersensitivity in a woman of 34 who exhibited a rash on the exposed parts after contact with these plants. When the skin was rubbed with the flowers they caused no reaction, but the leaves and stems did. Kren thought that the small hairs to be found on the stalks and leaves were responsible, as the hairless varieties caused no rash; Broers's opinion is that the leaves and stalks give out a variety of essential oils, and that these are the cause of the inflammation. He says that *Chrysanthemum vulgare* gives out a brown-staining oil which consists of one of the terpenes or an isomeric modification of camphor, and has been used as an abortifacient; Lewin is said to have once seen a pustular rash caused by this oil. The petals contain pyrethrum-camphor, ethereal oils, and tannin.

McCord, Kilker, and Minster,[6] writing on "pyrethrum dermatitis" (pyrethrum being generally regarded now as a genus of chrysanthemum), say that insect powders are extensively made from both the pyrethrum and chrysanthemum, and have observed the following types of lesion in workers in these insect-powder factories: (*a*) a vesicular eruption—the commonest; (*b*) a quickly healing erythema on the exposed parts; (*c*) a papular dermatitis; (*d*) an anaphylactic type with reddening of the face and an erysipeloid rash.

They think that the dermatitis is caused by "pyrethrum," a neutral ester, and certain acids to be extracted from these plants, which are said to yield 13 per cent. of resinous substances and up to 30 per cent. of alcohol-ether extractives.

The Royal Botanical Gardens, Kew, fail to record any cases, nor have any cases been reported at a large firm of horticulturists (Messrs. Suttons, of Reading) where inquiries were made.

Chrysanthemums are classed botanically in the natural order "compositæ," a group of aromatic, stimulating, and carminative plants. Amongst those cultivated, of which there are many with widely differing characteristics, hairy varieties occur, and the leaves of the different species are said by Finnemore[7] to yield essential oils varying from 0·01 per cent. to 0·1 per cent., some of which are used by the Japanese for medicinal purposes. There is an alkaloid "chrysanthemine" which is found to be a combination of stachydrine and choline, the latter being also found in the betel-nut. Different writers therefore agree that there are several possible sources of toxicity in the chrysanthemum. Smith[1] says, of plant dermatitis, that "any rough surface or prickles may abrade a delicate skin, and that almost any cell-sap may act as an irritant."

In the case recorded, which comes under the heading of McCord's type A but which differs clinically from Dawson's case and experimentally from that of Kren, it seems evident that the main factor in producing the dermatitis is chemical. The ether-soluble oils have been shown to be mildly irritant, and the varying but positive reactions obtained with the two surfaces of a leaf and with the petals, together with the history of irritation by the roots, is in accordance with this, owing to the relative permeability of the parts to the juices. This is further borne out by the patient's statement that the stronger-smelling varieties affected him first. The condition demands a skin abnormally sensitive to a specific irritant, which makes the probability of a mechanical irritant the more remote, as other hairy plants do not affect him.

The diagnosis of the condition, which may be of importance in compensation cases, should present no difficulty if a careful history be taken, especially of the relationship between the onset and work amongst the suspected plants. In doubtful cases a simple controlled leaf test, as indicated, should be conclusive.

Treatment in mild and recent cases consists of mild lotions, but those of longer standing may require drastic measures, as in the case recorded, avoidance of the source of irritation being, of course, essential.

My thanks are due to Dr. W. J. O'Donovan for his suggestions and permission to publish details of the case under his care; and to the director of the Royal Botanical Gardens, Kew, for having kindly supplied me with some of the botanical references.

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CLINICAL AND LABORATORY NOTES

THE MINIMAL FARADIC CURRENT AS AN AID TO DIAGNOSIS.

By Lieut.-Colonel J. K. McConnel, *D.S.O.*, *M.C.*, C.S.M.M.G.,

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The use of the faradic current for diagnostic purposes is well known in connexion with peripheral nerve lesions and with certain pathological conditions in muscles. The criterion in these cases is the muscular contraction, either by reason of its presence or its nature.

Besides this, faradic currents of weaker strength which do not elicit muscular contraction are of value in diagnosis, the sensations reported by the patient being the index. Unduly sensitive areas or spots may be located in muscles, fascia, ligaments, and joint capsules. As a rule these do not coincide with areas of tenderness to pressure, and where this is the case, the use of the minimal faradic current is of definite diagnostic value.

Spots unduly sensitive to faradism along the course of nerve trunks and hypersensitiveness at cutaneous levels may be of importance, but cannot be included within the compass of these notes.

TECHNIQUE.

The technique employed is similar to that which is well known in connexion with the localisation of spots suitable for galvanic acupuncture.[1] For the purposes under discussion, however, the testing electrode should be provided with a key, so as to differentiate between tenderness to deep pressure and sensitivity to weak currents, also as a check on the patient's replies. Usually the testing electrode should be of about 1·5 in. diameter, though a button electrode is required as well. Tests carried out before and during a course of treatment serve as a guide and check the progress at each stage.

CLINICAL VALUE.

The diagnostic use of minimal faradism falls under three principal headings: (1) the location of hypersensitive areas in recent and chronic trauma, especially in the back; (2) the discovery of certain areas from which pain is referred; (3) the differentiation between the origins of certain pains.

Characteristic examples of these have been found in patients treated under Dr. P. Bauwens in the Electrotherapeutic Department at St. Thomas's Hospital and in private practice. I am much indebted to Dr. Bauwens for permission to quote two of his cases.

1. *Recent or chronic trauma, especially in the back.*—When widespread tenderness to touch and extreme pain on movement is present or when localisation of tenderness to pressure is poor, the local treatment of small areas hypersensitive to faradism has been found to give marked relief.

Where residua of recent trauma exist, or when the site of origin of pain is hard to determine (either in subacute recent or chronic mild injury), minimal faradism fills a definite rôle, especially when tenderness to pressure is absent.

A case treated in the Electrotherapeutic Department at St. Thomas's Hospital demonstrates this point. A male, aged 40, had damaged his ankle whilst descending stairs some three months ago, during which time rest, fomentations, and physical treatment had been given. When seen there was no swelling and little tenderness, but the ankle ached on use. The external malleolus was not tender to pressure, but a spot (? in tibio-fibular ligament) was extremely sensitive to faradism; this was treated with a local dose of U.V.R.; three days later patient reported no pain in his ankle, though he had "tried it out."

2. *Referred pain.*—Pain may be referred from areas which are unduly sensitive to minimal faradism, although normal or only very slightly tender to pressure. Cases of this have been found in the Electrotherapeutic Department at St. Thomas's Hospital and also in private practice. With certain patients the local treatment of such an area, which had previously remained unsuspected, gave a speedy relief from referred pain.

3. *Differentiation of origins of various pains.*—This difficult task is often facilitated by minimal faradism. Pain long ascribed to osteo-arthritic joints has been found to clear up when soft structures unduly sensitive

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[1] E. P. Cumberbatch: Essentials of Medical Electricity. Sixth edition, London, 1929.

to faradism have been treated. The value of this electrical test will be appreciated by those who hold that this type of joint may cause referred pain only in certain acute phases.

Pain which appeared to be referred may be shown to be of local origin. This has been found as regards pain in the knee, around the ankle, and *in the foot.* The following case demonstrates this point.

Male, aged 65. Six weeks' history of pain in gluteal region, back of thigh, and in calf. Improved under physical treatment (diathermy, radiant heat, and acupuncture) during five months, but for a further six weeks pain in calf tended to persist. Test with minimal faradism disclosed sensitive spot above external malleolus, probably independent of *original* trouble. One local dose of U.V.R. (Kromayer lamp) cleared up this and residual leg pain.

PREVENTION AND ATTENUATION OF MEASLES WITH SERUM OF ADULTS.

By Matthew Burn, *M.C.*, *M.M.*, F.R.C.P. Edin., D.P.H., D.T.M. & H.,

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It is felt desirable to publish the following results principally because of adult serum being used to carry out the prophylactic measures. Since this work was begun in October, 1930, supplies of serum have been derived from volunteers in the Public Health Department, Birmingham—mainly health visitors. It is to be noted that the serum is *not* from convalescent cases but from adults who have had measles, usually in infancy. As was to be expected, owing to the human origin of the serum, no anaphylactic or other serum phenomena occurred from its administration.

Suitable cases of measles are found through the agency of the health visitors, and any cases of contacts under 5 years of age who are in delicate health or who are either acutely ill or suffering from a chronic condition such as asthma, rickets, bronchitis, or who are in homes where there is grave overcrowding, are given the serum, after consultation with their medical attendant.

Sero-attenuation.

Number of cases.	Average incubation period (rash to rash).	Type of attack.
3	10 days.	Normal.*
20	11 days.	Mild.
33	12½ days.	Very mild.
14	—	No attack.
70	—	—

* One child, aged eight months, had rash for three days and mastoid operation 10 days later; grave overcrowding in house.

Mild = Where rash lasted two to three days, was faint, little catarrh and child well. Very mild = Temperature, and very faint sparse rash lasting about 24 hours; no bronchitis; child well during attack.

Sero-prevention.

Serum injected up to third day from rash.	Type of case.	Result.		
		Aborted.	"Failures."	
			Very mild.	Normal.
50	Hospital.	48	2	—
26	Home.	23	2	1

Above are tabulated the results of some 70 cases which received serum for attenuation purposes, their ages varying *from* a few months to five years. The day *of administration* of the serum varied from the fourth *to* the seventh day *from the appearance of the rash,* the average being 5·5 days. The dose of serum given varied according to the age of the child, its condition, and the day of administration, the average dosage being 8 c.cm. It will be seen that in reference to these cases, the incubation period cannot be considered to have been appreciably lengthened.

"*Failures.*"—Eleven contacts were injected in one ward on March 26th, 1931, but two previous cases of measles had occurred on the 21st and 25th, and in all probability these two "failures" were due to the double incubation periods which were "running" at the time. No further cases occurred.

Two of the three cases of "failure" at home had been exposed previously to measles which was prevalent in the court where they lived, while the third case inadvertently received 75 per cent. less than the recommended dose.

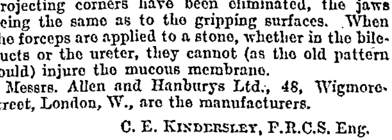
The average dose given to the above children, whose ages ranged from some months to six years, was 9 c.cm. These children were either post-operative cases or were suffering from some acute illness such as pneumonia.

From the experience above recorded it appears that the use of adult measles serum for either sero-prevention or attenuation gives comparable results to those obtained by other workers using convalescent measles serum. It is of course much more easily obtained.

NEW INVENTIONS

A MODIFICATION OF DESJARDIN'S FORCEPS.

Having been struck by the fact that the usual pattern of Desjardin's common duct forceps were smooth when closed, and presented some comparatively sharp corners on the blades when open, I have had a modification made to my own pattern. The only difference in the new pattern is that all the projecting corners have been eliminated, the jaws being the same as to the gripping surfaces. When the forceps are applied to a stone, whether in the bile-ducts or the ureter, they cannot (as the old pattern could) injure the mucous membrane.



Messrs. Allen and Hanburys Ltd., 48, Wigmore-street, London, W., are the manufacturers.

C. E. Kindersley, F.R.C.S. Eng.

Charing Cross Hospital.—In his speech at the annual meeting of the governors recently, Mr. George Verity, who presided, said that, in spite of watching over every penny of expenditure, the hospital had for the moment lost its proud position as the lowest in cost per bed of all the London hospitals. Pay wards are needed, but they would have to be additional to the existing beds, and nothing can be done in that direction until the cost of the new nurses' home (£60,000) has been completely dealt with. Mr. Verity expressed a fear that the payment of nine months' income-tax next January would have a serious effect upon subscriptions.

MEDICAL SOCIETIES

TUBERCULOSIS ASSOCIATION.

At a meeting of this association, held on May 15th, a paper on

Clinical Types of Hæmoptysis

was read by Dr. G. T. Hebert. Although hæmoptysis was, he said, one of the outstanding features of tuberculosis, the actual method of its causation was still uncertain, and, probably for that reason, treatment of the symptom was far from satisfactory. Any classification of hæmoptysis should be made not on purely academic grounds but with the definite object of enabling any particular case to be placed in its group so that the appropriate remedy shown by experience to be of value in that group might be applied without loss of time. Among the clinical features of hæmoptysis was the fact that it occurred both in ulcerative and in non-ulcerative conditions, and that it might be due to one of a number of causes. The amount of blood also varied from the minimal amount sufficient to constitute hæmoptysis up to a pint or more, the size of the hæmoptysis having no necessary relation to the extent or activity of the disease. Other variable features were the frequency with which it occurred in different patients and the stage of disease at which it might present itself—early, intermediate, or advanced. Tuberculous hæmoptysis was of varying importance, some cases having apparently little significance as regarded prognosis. It was impossible to say which were the factors determining a hæmoptysis. Fatigue, effort, trauma, and rise of blood pressure had all been incriminated, but in many cases these could be definitely eliminated. With regard to rise of blood pressure, Dr. Hebert pointed out that it was doubtful whether a rise in the systemic circulation, unless prolonged, was followed by a rise in the pulmonary circulation. A review of these clinical features made it evident that hæmoptysis was essentially fortuitous; a number of different causes must be responsible. Although arterial bleeding undoubtedly occurred in vessels exposed in cavities, a severe ulcerative process had been at work in such cases, and in fact the arteries had proved to be the most resistant of all of the pulmonary structures. In cases of quiescent or calcified or apparently arrested disease, arterial hæmoptysis was difficult to explain, especially when the duration of the bleeding was short and no subsequent evidence of activity obtainable. Some cases of hæmoptysis in tuberculosis as in other non-tuberculous conditions might be caused by capillary or congestive bleeding, due to back pressure.

A SUGGESTED CLASSIFICATION.

After a brief review of some classifications of hæmoptysis already proposed by various workers, Dr. Hebert suggested that a rational division would be into (1) large and small (or brisk and sluggish), and (2) arterial and venous, with the four subdivisions: large arterial, small arterial, large venous, and small venous. The large *venous* hæmoptysis was the distinguishing feature of the classification, and he enumerated some of the arguments in its favour, showing also that on the clinical side it would account for cases of a large hæmoptysis occurring in an apparently healthy individual. The hypothesis assumed that when a perforation occurred in a vein blood would flow out rather than air enter. It was difficult to assess the probabilities of the occurrence of these two events from arguments based on intrapulmonary pressure, but it might perhaps be admitted that air would be sucked into a large vein, but a vein of smaller size, yet large enough to give a brisk flow of blood, might bleed. Dr. Hebert went on to show how the suggested classification would explain without difficulty the clinical features mentioned above, including hæmoptysis occurring at any stage of the disease. He then put forward a few general indications for assigning a given case of hæmoptysis to its proper group. A brisk hæmoptysis in an apparently healthy individual was probably a large venous; in a chronic case probably a large arterial. A small hæmoptysis in an active case should be regarded, and treated, as small arterial, but might be small venous if there had been previous evidence of pulmonary congestion. Finally, the speaker dealt briefly with the way in which the suggested classification might be applied to treatment. Large hæmoptyses required mental and physical rest, suitable posture, and, where the bleeding showed after 15 minutes no sign of cessation or appeared to be arterial, morphia might be indicated and the use of salt or calcium to increase the clotting power of the blood, and compression by artificial pneumothorax considered.

At the evening session a discussion on the

Surgical Treatment of Extrapleural Complications

in pulmonary tuberculosis was opened by Mr. P. H. Mitchiner. Very few non-pulmonary tuberculous lesions, he thought, called for surgical interference. In only three situations surgery was called for as primary treatment: (1) Tuberculosis of the kidney where the other kidney was healthy and there was no evidence of tuberculous disease elsewhere; (2) old tuberculous glands in the mesentery; (3) tuberculous glands in which abscesses had *just* broken down and the skin over them was perfectly healthy. It was worth while here to attempt to dissect out the gland whole. In regard to tuberculous bones and joints, no good was likely to be done if there was surgical interference when any pulmonary lesion was present. Sinuses must be kept aseptic; surgery was, of course, called for if sepsis had occurred, but in aseptic cases ultra-violet rays for superficial and X ray for deeper lesions were better than surgical treatment. He referred to Rollier's success with non-surgical methods, perfectly normal bones and joints being obtained in about four years. The ideal treatment was sun treatment when possible. Where time was an object, fixation by plaster-of-Paris was necessary. The most intractable type was primary synovial tuberculous disease of the joint. This might be cured in four to five years, but about 60 per cent. of patients would probably relapse.

Discussing the value of tuberculin in non-pulmonary tuberculosis, Mr. Mitchiner said he had found it of definite use in genito-urinary tuberculosis, but not in peritoneal, glandular, bone or joint tubercle. The commonest situation of non-pulmonary tuberculosis was in the cervical lymph glands. A search should immediately be instituted for a local source of infection. In addition to those generally recognised, he believed impetigo to be a potent source of tuberculous glands. He did not believe that any normal healthy lymph node could become tuberculous. General hygienic treatment was important, and exposure to X rays was valuable if the patient could not be got away. With regard to surgery, it should be undertaken only when it was obvious that a broken down abscessed gland could be dissected out whole. If the skin was involved, he personally would leave it alone. If the resulting sinus had not healed up after three months, he always took an X ray photograph for the presence of any calcified tissue which would have to be removed. Neglected sinuses with superadded sepsis required thorough curetting of the track. In tuberculous peritonitis he was against surgical interference unless there was any intestinal obstruction.

Genito-urinary tuberculosis was of two types. The first was that of a patient who started with blood-borne renal lesions. These gave few signs in the early stage. The bladder was healthy, although the urine might contain many tubercle bacilli. Immediate removal of the diseased kidney should be undertaken, before the bladder, vesicles, prostate, and the other kidney were involved. The prognosis in such cases was good; about 70 per cent. of such patients operated on at St. Thomas's Hospital were still alive. The other type was where a patient with pulmonary disease had some secondary focus, however small, in the genito-urinary tract. No surgical interference whatever was justified in these cases; epididymal tuberculosis was always secondary to disease either of kidney or of lung. Fixation was important here; a suspender was not sufficient—the testicle must be strapped.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF LARYNGOLOGY AND OTOLOGY.

A MEETING of this section was held on April 17th, with Sir ROBERT WOODS, the President, in the chair.

Vallecular Dysphagia.

Dr. R. R. WOODS read notes on a condition—hitherto, he thought, undescribed—which he called vallecular dysphagia.

The patient, a man aged 54, first asked advice in June, 1930, complaining of 18 months' dysphagia. Solid food could not be taken with comfort; it stuck in his throat, and could be brought up by a kind of cough. Radiography showed that barium was held up in the valleculæ, and that when these were full the epiglottis was pressed against the pharyngeal wall so that breathing was impeded. On two occasions (February, 1930, and September, 1930) the floors of the valleculæ were burned by diathermy in an effort to cause cicatricial contraction and closure of the valleculæ. After each treatment he experienced great relief but the condition recurred. In February, 1931, the pharyngo-epiglottic folds were cut in an attempt to allow the food to pass more easily to the pyriform sinuses and thence to the œsophagus but this also gave only temporary relief.

The patient was now as bad as ever said Dr. Woods, and the question was whether palliative treatment by diathermy should be continued or whether some more radical treatment such as amputation of the epiglottis or an attempt to stitch it to the base of the tongue should be tried.

Dr. HORACE LAW suggested removal of the epiglottis in this case.—The PRESIDENT advocated the same procedure, through a suprahyoid pharyngotomy, and said he thought it a unique case.

Lateral Sinus Thrombosis.

Dr. T. O. GRAHAM showed two cases on which he had operated for lateral sinus thrombosis. In the first, since the diagnosis was obvious before operation, he had cut down and divided the jugular vein, and then cleared the large clot out of the lateral sinus. In the second case mastoidectomy had revealed an extradural abscess and lateral sinus thrombosis. Both were streptococcal.

Dr. PATRICK DEMPSEY advocated routine exposure of the lateral sinus in cases of simple mastoidectomy.—The PRESIDENT said that in his cases it had been the rule rather than the exception for an abscess to form in the deep tissues of the neck, around the divided ends of the jugular vein.

Dr. LAW reported a case of lateral sinus thrombosis with fatal termination.

The patient, a girl aged 18, was brought into the Adelaide Hospital on August 4th, 1930, suffering from pain in right ear and high fever. The attack had lasted only a fortnight; it was accompanied by grave constitutional disturbance. On examination acute tenderness and some swelling was found behind and above right ear; copious discharge was present, and acute inflammation of the drum was seen. There was no swelling over the mastoid, nor in the tissues of the neck, nor could the internal jugular vein be palpated. There was no sense of discomfort on deep pressure in the neck.

An ordinary radical mastoid was done, a large periosteal abscess was found, and cholesteomatous debris in the antrum and middle ear. Enough had been found to account for the high temperature and pain, and there was no indication to proceed further. However, three days later the patient had two rigors, and Dr. Law at once laid bare the lateral sinus over a large area, and found an abscess round it; the sinus was soft and showed no signs of thrombosis, and the condition of the neck was exactly as already described.

This interference seemed to make no difference in the condition of the patient, who still ran an extremely high temperature, going up most nights to 104° F. Injections of S.U.P. 36 and scarlatinal antitoxin were tried, but had no effect. Eleven days after the last operation the patient had another rigor, and her condition was so serious that Dr. Law decided to cut down on the jugular vein and see what the condition was. He opened the sinus above and it bled freely. The jugular vein was not easy to locate, for the tissues were extremely disintegrated and the vein itself very soft. It was opened and followed down right to the root of the neck and was found to be full of pus as far down as it could be followed. The wound was plugged and left open. A probe was passed up to meet another in the jugular bulb and proved this portion to be patent

The local condition steadily improved, but the patient developed definite pulmonary symptoms and began to expectorate evil-smelling sputum. This went on to hæmorrhages, one of which proved fatal on Sept. 6th.

Intracranial Abscess.

Dr. LAW also described the case of a girl of 17, who was brought to the Adelaide Hospital on Nov. 21st, 1930, in an unconscious condition, having complained of pain and discharge in right ear.

The history was that she had had an acute otitis some days previously and then got rapidly worse and became unconscious on the morning of the 21st. Beyond the discharge from the ear it was not possible to make any definite diagnosis. Dr. Geoffrey Bewley saw the patient and found reflexes fairly normal and there were no gross eye signs. He did a lumbar puncture and withdrew 50 c.cm. of fluid, under pressure but quite clear. Dr. Law at once proceeded to open up the ear, doing a radical mastoid, laying bare the sinus and breaking down the tegmen tympani. In both the groove of the sinus and under the tegmen were found fairly large subdural abscesses. When the first one, that of the tegmen, was opened, the patient at once stopped breathing, though the heart remained strong and pulse regular. She was kept alive partly by artificial respiration and partly by intratracheal oxygen, and Dr. Law completed the operation leaving the area wide open. In various attempts to make her breathe use was made of oxygen, carbon dioxide, stimulants, strychnine gr. 1/10th, pituitrin and sterile saline intrathecally. These attempts were continued for four hours and the pulse remained good throughout. After that time, as there seemed to be no prospect of any natural respiration, the attempts were given up. Permission for necropsy was refused.

Dr. T. G. WILSON said that when respiration ceased in these circumstances a cerebellar abscess was usually present, and its evacuation was usually followed by restoration of respiration.

Dr. GEOFFREY BEWLEY said he did not think cessation of respiration was due to the lumbar puncture, notwithstanding the large amount of fluid drawn away. He thought some more serious intracranial trouble was present.

Mr. A. A. MCCONNELL suggested three methods of restoring respiration, which had proved successful with him in cases of cerebellar tumour. These were: changing the position of the head, from flexion to extension or vice versa; putting the patient into the Trendelenburg position; and opening the foramen magnum.—Dr. GRAHAM mentioned cases in which he had used similar methods with success.

Dr. WOODS read notes on a case of temporal lobe abscess.

The patient had had right chronic suppurative otitis media since boyhood. On Oct. 29th he vomited and had a temperature of 103° F.; there was no rigor, and the pulse-rate was 70. He was almost deaf in the right ear, but there was no mastoiditis. The nervous system was normal except for a suspicion of facial weakness on the left side. On Oct. 31st the radical mastoid operation was performed. There was a defect in the tegmen tympani. During the following week he became drowsy, the pulse fell to 60, and the facial weakness increased, and on Nov. 7th the temporal lobe was opened, a large abscess was evacuated, and the cavity syringed out. Drainage was maintained by a rubber tube, which was removed 11 weeks later. The ear is now dry.

Mr. MCCONNELL, referring to the fact that gas was present in the abscess cavity, advocated the use of X rays in diagnosis.

Dr. WILSON read notes on a case of temporal lobe abscess in a child aged 9 months.

This child was admitted to the Royal City of Dublin Hospital with acute left mastoiditis, and ptosis of the left upper eyelid. Fourteen days after simple mastoidectomy complete left oculomotor paralysis occurred, and twitching of the right arm and leg was noticed. The temporal lobe was freely exposed and the dura incised preparatory to exploring the temporal lobe next day, but the child died a few hours later. Post mortem an abscess pressing on the right crus cerebri was found.

Dr. WILSON drew attention to the preciseness with which it was possible to locate the abscess in this case and to the fact that no macroscopic track of infection was found, either at operation or post mortem. He also read notes on a case of perisinus abscess with purulent meningitis.

The patient, a farmer aged 26, was admitted to hospital almost comatose. Lumbar puncture yielded turbid fluid under pressure, from which the *Streptococcus hæmolyticus* was isolated. At operation a large perisinus abscess was evacuated. After operation the patient's pulse and temperature became normal, and 11 days later he was sitting up in bed reading newspapers. Next day an acute exacerbation of the meningitis took place, and proved rapidly fatal.

These cases were discussed by Dr. LAW and the PRESIDENT, who pointed out the importance of "twitchings" as an early sign of intracranial trouble in children.

Papilloma of the Vocal Cord.

Dr. P. J. KEOGH showed a case of papilloma of the right vocal cord. The patient, a man aged 34 years, complained of hoarseness and cough for five months previously. The Wassermann reaction was negative and no tubercle bacilli were found in the sputum. Dr. Keogh demonstrated a papillomatous swelling the size of a split pea in the middle of the right vocal cord. He proposed to remove this growth by direct laryngoscopy, but was prepared to do a laryngofissure if necessary.—The PRESIDENT and Dr. LAW expressed the opinion that the more radical method of removal might be necessary.

Dr. DEMPSEY showed a case of epithelioma of the fauces treated with diathermy. No recurrence had taken place after ten months, and the affected area was occupied by soft scar tissue.

ISCHÆMIA OF MUSCLE AS A CAUSE OF ANGINAL PAIN.

A LECTURE BY SIR THOMAS LEWIS.

THE St. Cyres Lecture was delivered by Sir Thomas Lewis at the National Hospital for Diseases of the Heart on May 14th, with Dr. Frederick Price in the chair.

Sir Thomas said that throughout his address he proposed to use the term "angina pectoris" in the sense employed by Heberden, denoting a distinct disease. He wished to consider only the origin of the pain in angina, and not the general pathology of the condition. Since the first description of angina pectoris by Heberden the cause of the pain with which it was associated had formed the basis of much theoretical discussion; the first person to suggest that the disease arose from an affection of the coronary arteries was Edward Jenner, and this view was later put more plainly by Parry. Parry recognised that the blood-supply to the heart muscle was impeded by the rigidity of arterio-sclerotic coronary vessels, and that though sufficient blood might pass to nourish the resting heart, the quantity might be inadequate for vigorous exertion. This theory, however, offered no explanation of anginal pain. He also believed that the power of the heart failed during the attack and that consequently "syncope anginosa" was a common symptom of angina pectoris. Subsequent observation, however, has shown that syncope is rare in anginal attacks. Allan Burns in 1809 was the first person to draw a comparison between angina pectoris and the condition of a limb "begirt by a ligature," but he made no mention of the pain in a limb working under conditions in which the blood flow was impeded. Benjamin Brodie, in 1846, compared cases of arterial disease in the leg, showing gangrene of the toes, with angina pectoris, but he, too, made no reference to pain. It was not until 1866 that Potter drew an analogy between intermittent claudication in a limb and the pain of angina pectoris.

Various experiments had been undertaken to decide where the pain arose in a ligatured limb. Some observers had attributed it to a spasm of the arterial walls, but Sir Thomas had found that when the blood-supply *to a limb* was cut off and the muscle exercised until pain developed, the release of the ligature produced flushing of the skin over the muscles with the first pulse beat, while the pain persisted for several seconds longer. Charcot, who had observed a patient with intermittent claudication, had attributed the pain to cramp which he thought comparable to cadaveric rigidity, but although the pain could be obtained readily by the exercise of a ligatured limb, true cramp was rare, and there was no increase in the tone of the muscles.

EXPERIMENTAL PRODUCTION OF PAIN.

To establish the pain Sir Thomas and his co-workers had gripped a small instrument which recorded the force used by means of a spring. The circulation was cut off by means of a sphygmomanometer, and the grip was tightened once a second in time to a metronome. They had found that the pain arose after 30 to 35 seconds and became unendurable after 72 to 78 seconds; these times were remarkably regular and did not vary much between different individuals. The pain was diffuse and aching, and situated in the neighbourhood of the acting groups of muscles; tenderness developed in these muscles, which persisted after the pain had disappeared.

Pain had also been attributed to lack of oxygen in the muscle. Sir Thomas had found, however, that if the circulation was stopped in a limb kept at rest, no pain would arise. Moreover, if, with a ligatured limb the observer worked his muscles until he was within two or three *contractions* of the onset of pain and then *stopped, no pain* would develop. Yet in both these cases the muscles would be requiring oxygen, and the usual supply was not available.

Whether the load on the muscle or the rate of contraction was increased it was observed that the onset of pain and the point at which it became unbearable were expedited, so that the onset was clearly determined by the energy expended by the muscle. A clue to the origin of the pain had been obtained by a series of simple experiments. In the first of these the circulation had been cut off and the limb was worked until the pain had reached a certain level of intensity; work was then stopped, and it was found that as long as the ligature remained in place the pain persisted at the same level of intensity. When the ligature was removed the pain disappeared in from two to four seconds. For this reason, Sir Thomas said, he had concluded that the pain had a chemical or physicochemical origin; he believed that processes arose in the muscle-fibres during experiment which led to a change in the conditions in the tissue spaces around the fibres, and that it was the change in the tissue spaces which gave rise to the pain. Further experiments had helped to confirm this view; for example, when the ligature was released the pain disappeared within a few seconds; if, however, the ligature were replaced as soon as the pain had gone, and exercise was recommenced the onset of pain would be expedited. The shorter the rest interval the earlier the onset of pain, and it could be assumed that the process occurring in the muscle required longer to subside than the process arising in the tissue spaces. Another experiment bore this out; exercise was performed in a ligatured limb until pain arose; the ligature was then released but the exercise maintained until the pain disappeared, when the ligature was reapplied and the exercise stopped. It was found that pain developed again within 20 to 30 seconds, showing that some change had been engendered in the muscle which gave rise to the collection, in the tissue spaces, of the factor responsible for pain. So long as the circulation was free no collection of this physicochemical factor could arise, and therefore pain could not develop.

PAIN IN CORONARY THROMBOSIS.

If anginal pain was due to ischæmia then pain ought to arise either when the work of the muscle remained constant and the blood-supply was diminished, or else when the work of the muscle was increased and the blood-supply became inadequate. There were certain similarities between the pain produced in coronary thrombosis, where there was no increase of work but part of the blood-supply to the muscle was cut off, and the pain of angina pectoris. In both conditions pain was severe and continuous, not spasmodic, and the situation was the same in both, involving the præcordium and the upper and lower regions of the sternum. Epigastric pain was commoner in coronary thrombosis, and the pain persisted for a longer period than in angina. Coronary thrombosis offered the best clinical evidence that occlusion of a coronary vessel gave rise to pain. Sutton had borne out this finding by passing a ligature round the coronary vessels of anæsthetised dogs; *traction* on the ligatures when the dogs regained consciousness gave rise to pain, and he had not been able to elicit the symptom by experiments on neighbouring structures.

If coronary thrombosis were considered in terms of muscular ischæmia it would be realised that the part of the heart muscle supplied by the occluded vessel *continued to work*, heaping up the pain-producing *factor* in the tissue spaces. This would explain the gradual onset of the pain and its long duration.

EXCITING FACTORS.

The theory of anginal pain originally suggested by Parry had supposed it to be due to an increase of tension in a sore or irritable aorta, and in this case a rise of blood pressure should always precipitate an attack. In certain cases of paroxysmal tachycardia, associated with angina, however, there was no rise of blood pressure, but anginal pain might arise during the paroxysms; there could be no question of strain on the aorta here. Nor must it be assumed that in the angina of effort the pain was necessarily due to a rise in blood pressure unless this was confirmed by observation. In some cases where the patients had severe heart disease, usually aortic regurgitation, the early anginal attacks occurred on effort, but later they developed while the patient was in bed, often in the early hours of the morning; the rise in blood pressure in these cases was conspicuous, and the attack was usually relieved by inhaling amyl nitrite.

That changes in the blood pressure were not the only exciting cause of an attack could be shown by the case of a man who developed no pain after exercise but in whom attacks were readily induced by food, especially anything which required chewing. It was found that although the blood pressure rose slightly during the attack, it did not fall when the pain disappeared, and a much higher blood pressure was produced by exercise, though this did not provoke an attack.

Amyl nitrite was usually supposed to relieve an attack by causing a marked fall of blood pressure, but observations in the ward had shown that this was by no means always, or even often, the case. The fall, where it occurred, was usually slight, and in some cases the blood pressure actually rose. It was far more probable that amyl nitrite acted by dilating the coronary arteries; the consequent increased flow of blood to the heart muscle swept away the pain-producing factor from the tissue spaces. In coronary thrombosis, as might be expected, amyl nitrite gave no relief because it could not open up the occluded vessel.

HARROW HOSPITAL.—The Stuart Memorial extension of the Harrow and Wealdstone Hospital, which has been erected and equipped at a cost of nearly £38,000, was opened by the Duke and Duchess of York on May 6th. In reply to an address of welcome the Duke of York said that there could be no finer memorial than a hospital, and the descendants of the late Mr. and Mrs. J. N. Stuart would be glad that a name so closely linked with the hospital would ever be held in remembrance through the new extension. Mr. Stuart was a former president and secretary, and both he and Mrs. Stuart were generous in gifts and services. The hospital is electrified in almost every respect; no fireplaces or radiators are to be seen, all the heating being done by the wall panel system. There is a contributory scheme by which persons with incomes of less than £750 a year can secure hospital treatment in return for an annual subscription.

obtain Certificate E on the strength of the post-mortem examination without inquest, under Section 21 of the 1926 Act. Such examination, as a safeguard in cremation cases, should, in Dr. Waldo's opinion, never be made by the medical practitioner in attendance on the family, nor should it ever be conducted in a private house. The third main modification in the law is the provision in Section 20 of the Act for adjourning inquests when criminal proceedings in murder, manslaughter, or infanticide cases are under way in the magistrates' courts. The total of such adjournments in 1929 was almost the same as that for 1928.

Too many inferences must not be drawn from the Home Office statistics, least of all in items where the figures are small and subject to sharp fluctuations. Just as there is no special significance in the drop in treasure trove inquests from five to one in 12 months, so also no firm deduction can be safely made if the verdicts of deaths due to drink, or of deaths due to disease aggravated by other people's neglect, are twice as high for 1929 as for 1928. But undoubtedly the figures of verdicts of accidental death, which have been mounting by roughly 1000 per annum, reflect the dangers of modern traffic which the "Safety First" movement is endeavouring to reduce. The heavy drop in verdicts of death due to natural causes (including old age) can be explained by the new procedure, already mentioned, of substituting a post-mortem examination for an inquest. The total in this respect has fallen by about 5000 when compared with the total four years ago. Verdicts of stillbirth are dropping steadily; so also are verdicts of death due to want of attention at birth, and verdicts of accidental death where children have been suffocated while in bed with their parents or others. In one of the final paragraphs of the official Introduction to the Statistics it is stated that only one inquest out of 32,612 was followed by a second inquest on the order of the High Court. This fact the Home Office considers a remarkable testimony to the manner in which coroners and their juries perform their duties. It is a fitting tribute to the *officium coronatoris*, an office which, in the City Coroner's words, has throughout many centuries contributed in no small degree to the protection of the lives of our countrymen.

APICAL INFECTION OF THE TEETH.

When the importance of dental sepsis as a factor in general disease was first emphasised by Dr. William Hunter, attention was chiefly concentrated on pyorrhœa as the obvious form of infection. But improved radiography often showed teeth with areas of rarefaction round the apices. Nearly always these teeth were pulpless, and when one of them was extracted a small mass of tissue, attached to the root and corresponding to the rarefied area seen in the radiogram, came away with the tooth. Though these masses of tissue, which are now termed granulomata, had long been familiar to the dental surgeon, and their structure had been studied, yet since the condition was usually painless, it had not been realised how common they were. The conception of dental sepsis had therefore to be widened by the inclusion of the granuloma. Since no drainage into the mouth was possible in this form of infection, the view was put forward, and soon became popular, that the granuloma was more serious than pyorrhœa, since the passage of toxins was directly into the blood, whereas in pyorrhœa the passage of toxins was chiefly into the mouth. The distinction between open and closed infection thus assumed great significance in connexion with systemic infection.

From this time onwards increasing interest has been taken in the bacteriology and histology of the dental granuloma. Weston Price has suggested that it is a defensive barrier against infection arising in the tooth and may thus indeed indicate a successful reaction. This point of view has attracted much attention, for it has implied the possibility that "dead" teeth may not always need extraction. Some observers have reported that granulomata might be sometimes sterile, but often their technique has not inspired complete confidence in their conclusions. The most recent work on apical infection is contained in a series of four papers in the *British Dental Journal*[1] by Mr. Arthur Bulleid, which form by far the most exhaustive study yet made in this country, and represent an important advance in dental pathology. Mr. Bulleid has examined a large number of teeth which showed a granuloma radiographically. The teeth were extracted and cultures taken under strict precautions against contamination. Both aerobic and anaerobic methods of culture were used, and this proved highly desirable, for in eight cases granulomata which were sterile by aerobic methods showed a growth of streptococci on anaerobic culture. Bacterial infection was found in all 80 granulomata examined, and in every case streptococci were isolated, though other organisms were often present as well. A further interesting point revealed by this investigation is that granulomata are relatively common in pulpless teeth which have had their root canals carefully filled. It would be unfair to assume from this that treatment of pulpless teeth ought not to be undertaken, but it is at least possible that the principle of filling the canals up to the apex, which many dentists have regarded as fundamental, may have to be modified.

Besides his bacteriological work Mr. Bulleid has studied the minute structure of the granuloma and sets out his results in a series of microphotographs of high technical excellence. His research carries our knowledge a definite stage further, and should long be a standard for reference.

SMALL-POX PREVENTION AND LOCAL AUTHORITIES.

In April of last year the administration of the Vaccination Acts passed from boards of guardians to local public health authorities, and like other duties thus transferred was left unamended. The

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[1] Brit. Dent. Jour., Jan. 16th et seq.

Ministry of Health has now issued a review[1] of certain present aspects of small-pox prevention, to assist them in considering the necessity or otherwise of any modifications in the administration of these Acts. The review assesses the different factors in the epidemiology and clinical characters of small-pox which have been experienced in recent years, records the results and extent of vaccination and the incidence of small-pox in this country, and correlates this information with the findings of the Rolleston report and with the extension of the practice of other forms of immunisation against disease. This country, it is pointed out, is now and has long been intrinsically more vulnerable to the spread of severe epidemic small-pox than are European countries, like France and Germany, where the population is immunised compulsorily against small-pox by repeated vaccinations. On the other hand, the protective methods which are part of ordinary English administration, and include vaccination, have proved themselves on many occasions sufficient to prevent the development of epidemics of severe small-pox when introduced, either by extinguishing it at the start or by circumscribing the local epidemic which occurs and ultimately setting the community free of the results of the invasion. There is no reason, the review states, to expect that these will not be as efficacious in the future as in the past, but it demands vigilance not only from the local health authority but from the central authority which has to treat severe small-pox in the same way as other exotic diseases such as plague, cholera, or typhus, from the point of view of surveillance, if it is to be extinguished.

There are, however, modifications of procedure which may be considered by health authorities in any district invaded by the present type of mild small-pox. When small-pox first appears it is argued that the question of whether it is major or minor is of little consequence, seeing that the action required is in all respects identical for the two varieties. No effort should then be spared to notify, isolate, disinfect, vaccinate, and trace contacts, as is done when a severe type of disease has been imported from the continent. Happily any kind of small-pox control is favoured by the absence of ability to infect until the first symptoms of illness have occurred and by the possibility of immunising any contact if vaccinated within 48 hours of exposure to infection. Practically speaking, there is no "healthy carrier" problem in small-pox. But when this first stage has passed no authority need work on the principle of doing everything applicable in the case of a major small-pox epidemic. The question may arise whether the risk can justifiably be taken of allowing a patient to remain at home if he can be reasonably isolated there and all other occupants of the dwelling can be protected. Some feel that variola minor might be treated in an isolation block or in special wards of a general fever hospital whose staff is fully protected by vaccination. It is open to doubt whether public health authorities at present obtain as they might the coöperation of medical practitioners in the district. The issue to them of up-to-date clinical accounts of variola minor would have its advantages, and in return vaccine lymph might be supplied from the health office for immediate use in suspected cases, particularly now that a smaller area of vaccinated surface is officially advocated. Should procedure in these and other directions become more elastic there would, the report suggests, still remain one situation not included in present legislation for which compulsion would seem justified on every ground of preventive medicine. This is the case of the person, unprotected by recent vaccination or by previous small-pox, who is known to have been exposed to small-pox infection, at a time when his prompt vaccination will in all probability prevent the development of the disease.

In a brief summary the report indicates the kernel of this administrative position. Variola minor can usually be effectively and speedily extinguished on its first appearance in a district by the same methods as those applicable to variola major. When once it has taken hold the only workable procedure is to keep the disease under a reasonable degree of control, relying on its low infectivity and tendency to die out from an area in a few years. Such practicable control, in addition to insistence on prompt notification and provision of aid in diagnosis, includes hospital isolation, the tracing of direct contacts and offers of vaccination to them, as well as popular and unbiased education of the population on the safeguards which the individual can secure by vaccination against any variety of small-pox, and on the way in which he can obtain a vaccination with the minimum of inconvenience and risk. The report recognises that in this country at the present time it would be impracticable to secure a population so vaccinated as to render all other measures against small-pox redundant. It may be found by public health authorities that they derive little advantage from the Vaccination Acts that could not be obtained more satisfactorily if the Acts were replaced by voluntary measures. It would, of course, be out of the question to use the present machinery for maintaining protection at several stages of life by repetition of the one-mark vaccination. On the other hand, in its normal work of infant welfare the local authority is advising mothers on the general care of children and should more readily secure voluntary acceptance of vaccination. Public vaccinators would vaccinate as officers of the health department. The numerous occasions on which local authorities advise or influence adult communities on health questions could then be utilised. After they have observed the working of the Vaccination Acts under the new conditions the Ministry of Health looks to these authorities to formulate such proposals as seem to them desirable for preventing the spread of small-pox.

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[1] Ministry of Health. Reports on Public Health and Medical Subjects. No. 62. A Review of Certain Present Aspects of Small-pox Prevention in relation particularly to the Vaccination Acts, 1867–1907. H.M. Stationery Office. 1931. Pp. 67. 1s.

ANNOTATIONS

NARCOTIC DRUGS AND THE LEAGUE OF NATIONS.

On May 27th there will assemble at Geneva yet another international conference on the traffic in dangerous drugs. A draft convention, submitted by the Opium Advisory Committee of the League of Nations, will form the basis of discussion by the conference, while alternative plans favoured by certain nations will not be precluded from consideration. The draft convention purports to supplement the provisions of The Hague Opium Convention of 1912 and of the Geneva Convention which was elaborated, after lively discussions, only six years ago. The main problem to be solved is how to give practical effect to the provision (Article 9) of The Hague Convention, which required the contracting nations to limit exclusively to medical and legitimate purposes the manufacture, sale, and use of the alkaloids and their derivatives of the opium poppy, and the coca leaves, and to coöperate with a view to preventing their use for any other purpose. Although the Geneva Convention of 1925 was claimed to have strengthened and improved the original provisions of The Hague Convention of 1912, it was officially admitted that "during the next five years the *illicit* traffic assumed alarming proportions." While the Opium Advisory Committee appeared to be content to proceed under the Geneva Convention, the Assembly of the League, impressed by the disclosures in regard to the alarming extent of the illicit traffic, urged the need for directly limiting the manufacture of the narcotic drugs to the amounts required for medical and scientific purposes, and directed steps to be taken to implement the Geneva Convention to that end. The scheme implied the ascertainment of the annual world requirements, the quota to be allotted to each manufacturing country, and the appropriate distribution of supplies by some central organisation. A conference held in London last November failed to agree either on the principle or the amounts of the quotas, and postponed the question for further investigation. The advisory committee, with an enlarged membership to include non-manufacturing countries, has reported to the council on the present situation and on the draft convention which it has prepared for consideration, rejection, or amendment by the conference. In as much as objections have been raised by the Japanese, Turkish, and Yugo-Slav delegations, as well as by certain non-manufacturing countries, the conference bids fair to be an interesting one. While it appears, from a reply recently given in the House of Commons, that the limitation of production of raw opium and of coca leaves, the original sources of the drugs in question, is not regarded as relevant, it would seem impossible to exclude from consideration a question of such fundamental importance.

RADIOGRAPHY OF INTRACRANIAL BIRTH HÆMORRHAGE.

Post-mortem examination of the brains of new-born infants is well known to be difficult, and the only really satisfactory method is that in which the severed head is hardened in formalin. This, of course, is usually impracticable, at any rate in this country, but L. Schoenholz has devised a means of obtaining radiological evidence of intracranial hæmorrhage in cases where autopsy is not permitted. Both jugular veins are severed, and a mixture containing gelatin and red lead is injected into one of them until it appears in the other. Stereoscopic radiograms are then made, and have been held to localise the hæmorrhages accurately. Dr. F. M. B. Allen and Dr. H. I. McClure,[1] of Belfast, now describe a method which they have adopted, and reproduce radiograms which are said to demonstrate intracranial birth hæmorrhages. The opaque solution which they used was röntyum, which has the advantage that it does not gravitate. The röntyum was injected into the carotids or umbilical vessels, and the radiograms show that it penetrates the small arterioles; they also make it clear that there have been extravasations from the vascular system. Allen and McClure seem to deduce from this that arterial hæmorrhage is met with in the new-born—a supposition which must be received with great caution, since it is unsupported by the mass of evidence derived from examination of hardened brains. Similar results were obtained in 1929 by M. H. Roberts by a somewhat different method, and Prof. H. Ehrenfest, in his authoritative work on "Birth Injuries of the Child" (1931), makes the following comments on Roberts's results: "Roberts, however, in an endeavour to improve upon Schoenholz's technic, substituted metallic mercury as an injection fluid, incidentally forgetting that intracranial hæmorrhages practically without exception originate from veins. He injected this heavy metal into the carotid arteries, and believes that his very clear roentgenograms actually show intracranial hæmorrhages, although it is more reasonably assumed that they only represent artefacts resulting from the injection of this heavy substance into the notoriously fragile vessels of the brain." Though the solution used by Allen and McClure has advantages over metallic mercury, Prof. Ehrenfest's comments probably apply with equal cogency to the results they describe. Further, the radiographic demonstration of *apparent* arterial hæmorrhages raises a measure of doubt whether extravasations revealed by injection of the venous system really correspond to ante-mortem hæmorrhages.

DISCOUNT BY DENTISTS.

Sir Francis Dyke Acland, prevented by illness from opening in person the twentieth session of the Dental Board of the United Kingdom on May 12th, sent an unusually racy presidential address which was read by Sir Holburt Waring. After commenting on the unbelievable size of dental announcements in Glasgow which he had made a special journey to inspect—in many cases they were, he said, larger than most tradesmen in most towns would consider self-respecting—he warned dentists against directory touts and went on to consider whether it is proper for dentists to give commission or discount to, or in connexion with the treatment of, any particular class of persons. The question had lately been raised in slightly differing forms in connexion with the Benevolent and Orphan Fund of the National Union of Teachers, the Irish Bank Officials Guild, the Marine Engineers Association, the Sheffield Civil Service Guild, and Co-operative Societies at Kidderminster and Ynysybwl. "It may be useful," said Sir Francis, "if I summarise, in the form of a simple working rule for the profession to observe, what has been our view since the question first came up. We express it habitually when our advice is asked in individual cases, but I cannot remember whether it has previously been publicly stated. May I put it in this way: When it is suggested to a dentist that he should allow a discount from his usual fees, let him ask himself this question. 'Can I prove without any question that this discount is simply a discount for cash and fairly represents my saving in trouble and expense in collecting my accounts? If not, I had much better have nothing to do with it.' This is a simple rule to follow, and I believe it to be perfectly sound and justifiable, for our experience shows that there are only two classes of discounts, one the discount for cash, and the other the discount for the introduction of patients. The second may be variously and sometimes heavily disguised, but on examination always appears as the underlying motive, and to give commission for the introduction of patients is clearly a wrong thing to do between man and man." Sir Francis added that it was also, of course, one of the matters which might cause difficulty for a practitioner with the Board, for it was specifically covered in the words of the Important Notice: "The Board do not approve of a dental practitioner paying, or allowing, a commission or discount to any other person or body of persons as a return for patients being sent or recommended to him, or for dental services rendered by him to such patients."

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[1] Arch. of Dis. in Childhood, April, 1931, p. 97.

AVERTIN AND "RINAROM."

WRITING with an experience of 1200 cases of avertin narcosis Max Wülfing,[1] who has used the drug for four years, shows himself one of its staunch supporters. Like most others, he has given up trying to get true anæsthesia with avertin alone, but he finds that the drug does in fact produce it in a small proportion of cases. Employing a dose of from 0·06 to 0·1 g. per kg. body-weight—except in children for whom he uses the higher dosage of 0·15 g.—he always obtains perfect amnesia, and usually unconsciousness before any additional anæsthetic is administered. This additional anæsthetic he supplies in the form of a mixture of ether (12 parts), chloroform (1 part), and ethyl chloride (2 parts) with a balsam perfume, and he gives it from an Ombrédanne mask. The additional CO_2 necessarily inhaled by the use of this instrument he values for its stimulant effect on the respiratory centre, and he finds that pulmonary complications are rare and trivial. The mixture evokes, of course, less mucous secretion than pure ether. It goes by the name of Rinarom.

AXEL HOLST.

THE death of Prof. Axel Holst, full of years and honours, removes the man who probably ranked higher than any other living Norwegian in the world of medical science. His associates had, indeed, hoped that his pioneer work on scurvy and beri-beri would have won him the Nobel prize. Between 1904 and 1910, with the help of his assistant, Frölich (now Prof. Frölich), Holst examined the evidence of the then common belief that beri-beri and scurvy are caused by an infection or some other poison existing in foods supposed to have become contaminated. Feeding tests on fowls and guinea-pigs showed that their response to a diet of polished rice was not one and the same, the guinea-pigs developing symptoms similar to those of human scurvy, while fowls developed polyneuritis. It was also found that scurvy could be produced in swine by feeding with rye bread, or rye bread plus cooked beef, or rice and dried cooked fish. Most of the swine thus tested also developed polyneuritis, and Holst and Frölich came to the conclusion that this combination of the symptoms of beri-beri and scurvy must be identical with the symptom-complex known as "ship beri-beri." During the last seven or eight years of his life, Holst made extensive investigations into the ætiology of pernicious anæmia, a summary of which we published on Feb. 7th. His studies of scurvy, beri-beri, and pernicious anæmia, constituted only a small fraction of his activities; he played an important part in housing, sanitation, medical education, and many other departments. He used often to classify his fellow beings as Yes-persons and No-persons. He was essentially a Yes-person himself. Overcharged with intellectual electricity, he could be relied on to provide a shower of sparks on coming in contact with kindred minds, and his interests were so wide that their number was great.

TUBERCLE BACILLI IN THE BLOOD.

Prof. Otto Kren and Prof. E. Löwenstein have made further progress[1] in the elucidation of cutaneous lesions of suspected tuberculous origin. Their work is based on the production by Löwenstein of a new culture medium for the tubercle bacillus, announced at the International Dermatological Congress held at Copenhagen in August last. It was there reported that of the 44 cases examined no less than 33 (or 75 per cent.) yielded positive blood cultures—a result which is the more surprising when it is realised that the laboratory workers were uninformed of the clinical nature of the cases from which blood had been withdrawn, and were even unaware which were submitted as controls and which were to be tested for cultural evidence of active tuberculosis in the circulation. An additional 22 cases in the present communication brings the total up to 66, which may be tabulated thus:—

	Total.	Pos.	Neg.
Erythema induratum (Bazin) and tuberculous phlebitis	23	16	7
Papulonecrotic tuberculide	4	4	—
Acne telangiectodes	4	2	2
Granuloma annulare	3	1	2
Lupoid	1	1	—
Scrofuloderma	3	2	1
Miliary tuberculous ulcer	1	—	1
Lupus vulgaris	10	5	5
Lupus erythematosus	17	10	7
Total	66	41 (62%)	25 (38%)

There was a striking difference between the proportion of positive results obtained on a first examination in the spring (100 per cent. positive), summer (75 per cent.), and autumn (62 per cent.), which the authors interpret as a seasonal variation in the quality of the blood. Summarising the results so far obtained they conclude that every suspect case of tuberculosis cutis (and this may well include other forms of tuberculosis met with in practice) should be submitted to cultural tests, which in their opinion are more reliable than complement fixation, agglutination, or precipitation tests, and which can be carried out in 4–5 weeks as compared with the 6–12 months of guinea-pig experiment. Reaction tests, such as those of Pirquet and Mantoux, do not tell us, in the event of a positive result, whether the focus is active, latent, or eradicated. A positive cultural result, on the other hand, affords definite evidence which is not easy to explain away. The absence of such evidence in clinically obvious tuberculous cases would depend, according to the Viennese authors, on the evolutionary phase of the lesion, whether it is in fact "open" or "closed," as in a certain proportion of cases of lupus vulgaris, erythema induratum, and granuloma annulare. That 10 out of 17 cases of lupus erythematosus should yield positive results supports the tuberculous ætiology of this affection. Löwenstein's technique for the preparation and inoculation of blood specimens introduces a new principle in bacterial culture. He maintains that hæmoglobin is inhibitory to the growth of the tubercle bacillus, and that its presence in earlier cultural experiments explains the large percentage of negative results.[2]

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[1] Med. Klinik, May 1st, p. 655.

[1] Wien. Klin. Woch., March, 1931, p. 405.

Ten cubic centimetres of blood are drawn into 3 c.cm. of 10 per cent. sodium citrate and centrifugalised. The plasma is drawn off and the blood-cells are hæmolysed with acetic acid; 15 per cent. sulphuric acid is added, and the mixture thoroughly shaken for five minutes. After washing out the acid with sterile water several times, the whole sediment is floated on to the culture medium, and the tubes incubated in the usual way. The culture medium itself is by no means easy to prepare. It contains in various proportions egg albumin, potato flour, asparagin, glycerin, potassium phosphate, and magnesium sulphate, and to this complex mixture a 2 per cent. solution of Congo-red is added before filtration and sterilisation, as for Löffler's serum. The inventor, who has been working on his subject since 1905, states that peptone should never be used if good results are to be obtained.

One difficulty in preparing Löwenstein's medium is the exclusion of moulds and contaminating organisms. On another page of our present issue Dr. H. M. Schwabacher describes a shorter and simpler way of preparing this medium, by means of which she has obtained a culture of tubercle bacilli from the blood recognisable as such on the sixteenth day. Dr. Schwabacher agrees with R. Russew,[3] who has worked in Löwenstein's clinic, in expecting the method to discover the tuberculous origin of many doubtful skin lesions.

ATTENDANCE OF HONORARY HOSPITAL STAFF AT INQUESTS.

It is the sensible practice of coroners, when investigating hospital deaths, to be content in ordinary cases with the evidence of the house surgeon and to refrain from summoning members of the honorary staff. A correspondent has lately asked what is the authority for this practice. The answer is that it is founded upon reason and on the desire of coroners not to make their proceedings vexatious. No class of witnesses, of course, can claim exemption from attendance at an inquest; the coroner must always obtain the proper evidence which his court requires. But, unless in exceptional cases, the evidence of the house surgeon suffices. There is neither statutory nor judicial authority on the point, but the practice received some confirmation through an incident at Oxford, over 50 years ago, summarised in our columns at the time and perhaps worth rescuing from oblivion to-day. Edward Law Hussey, surgeon to the Radcliffe Infirmary from 1850 to 1878, became coroner for Oxford city in 1877 and did good work in that capacity. He was, however, a man of unaccommodating temper. At the end of 1878 he held an inquest on a labourer whose leg had been crushed in a threshing machine and who had died in the infirmary of exhaustion after amputation of the limb. Hussey had been informed of the death merely because the patient had been admitted in consequence of the accidental injury. An experienced house surgeon, who had apparently seen the patient on admission, and who was the last medical officer to see him before his death, was available as a witness but was not subpœnaed. Hussey preferred to summon his former colleague, Horatio Symonds, who had performed the amputation. Symonds wrote a polite note to the coroner saying that he had an appointment elsewhere at the day and hour mentioned, but that the house surgeon would be able to give all necessary information. Hussey replied that, if Symonds did not attend, process would be issued against him. The day of the inquest came and Symonds did not appear; Hussey adjourned for two days and issued a warrant for Symonds's arrest. The explanation given to the jury was that evidence from the operating surgeon was required in order to decide whether the operation was necessary. The foreman of the jury agreed and said the witness should attend so that the jury could ascertain whether the patient was fit to undergo the operation. One can imagine the chaos which would ensue if the propriety of every serious operation were to be referred to a coroner's jury when death followed. At the adjourned inquest Symonds appeared in the custody of the police, but his counsel succeeded in persuading the coroner to order his release. A few weeks later another death in the infirmary was reported, a man having broken his back through falling from a wagon. Hussey again summoned Symonds, instead of the house surgeon, to give evidence at the inquest where there was apparently some altercation which did not enhance the dignity of the proceedings. Symonds began an action against the coroner in respect of the circumstances of his arrest. According to Victor Plarr's account of Hussey in the Lives of Fellows of the Royal College of Surgeons, Symonds also appealed to the Home Office and managed to obtain a ruling that it was sufficient in ordinary cases that the house surgeon should attend an inquest to give evidence. Nice questions of law might have arisen had the action proceeded. As he is the judge of a "court of record," a coroner is immune from actions for trespass for turning a man out of his court or for slander in a summing-up; but he may be liable in an action for false imprisonment if he has acted in excess of his jurisdiction. Hussey settled the action by making an ample apology to Symonds (published in the *Oxford Times* during February, 1879) and paying £20 towards his preliminary legal expenses, which sum Symonds forthwith gave to the infirmary. As we observed at the time, Symonds deserved the thanks of the profession for his bold resistance to a vexatious innovation.

The incident is hardly likely to recur. If it does, a word of warning should perhaps be given. A coroner's summons is not to be ignored by the honorary surgeon of a hospital merely because it is vexatious; some other solution should be sought than flat disobedience. The coroner has three different powers of enforcing his requirement of attendance. Under Section 19 of the Coroners Act of 1887 he can summarily impose upon any person who fails to appear after being duly summoned a fine of 40*s*. which in 1926 was increased to £5. This section is taken to include medical witnesses, though Section 23 gives the coroner the special power to prosecute a medical practitioner who fails to obey a summons. Under Section 23 the practitioner, unless he shows good and sufficient cause for not having obeyed the summons, may be fined £5 by the magistrates; this section, however, is the less likely to be used because the coroner would prefer to impose the fine himself directly under Section 19 rather than undertake a prosecution under Section 23 on the issue whether there was "good and sufficient cause," especially as the issue would be for the magistrates and not the coroner to decide. Thirdly and finally, the coroner's inherent power of punishing defaulting witnesses by fine or imprisonment as for a contempt of court is expressly preserved in the Coroners Act as an alternative to the statutory fines under Sections 19 and 23. The risk of disobedience, therefore, is by no means limited to a maximum of £5, though it is hard to imagine the circumstances in which a coroner would have recourse to such powers against a medical practitioner.

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[2] Deut. Med. Woch., 1930, lvi., 1010.

[3] See THE LANCET, 1930, ii., 200.

AN EXPLOSION AT OPERATION.

THE latest reported instance of explosion at an operation does not seem to present any fresh problem in connexion with this accident or to show any unsuspected dangers which may occasion it. The inflammable nature of the anæsthetic vapours used is not in doubt, for ether had been inhaled a little time before, although it was not being taken at the time of the explosion; but the exact manner in which they were detonated is here uncertain as it has often been before. No actual cautery or open flame was brought into contact with inflammable vapours, but merely an electric "pencil-lamp." Defective contact is suggested as the explanation for the exploding spark, but it is permissible to wonder whether a mere lamp, if sufficiently hot, cannot cause explosion of a mixture of oxygen and ether, supposing this to be in its most susceptible proportions. In other cases, notably in that most recently reported[1] from across the Atlantic, there is the same difficulty of accounting for the presumed spark. There was an explosion of nitrous oxide, ether and oxygen, and static electricity was the assigned explanation. This explosion was a violent one and the patient died outright. In the Birmingham case the explosion was less and the patient died only some days afterwards from putrid bronchitis. Prof. Haswell Wilson, who made the post-mortem examination, said that the appearances suggested that the flame had been transmitted down the bronchial tree. The facts, as we gather them from the press reports, are briefly these: A fitter, aged 60, was admitted to the General Hospital, Birmingham, for a second operation for cancer of the œsophagus. During March he had been in the hospital, and the growth being regarded as inoperable, radium had been inserted. He returned to the hospital on April 14th and on the 15th he was taken to the operating theatre in order that some dilatation might be attempted, since only the thinnest liquids could be swallowed. The surgeon used a pencil light with current derived from an accumulator. The explosion occurred while he held the pencil in the patient's mouth. It was, he said, deafening and upset his hearing for the rest of the day. It appeared to start in the apparatus, which went up to the ceiling. His own hair was singed and the side of his face burned. The damage in the patient's throat was caused by the explosion, not by any instrument. The anæsthetic had been first a mixture of chloroform and ether, then ether, and later, chloroform only. It was stated by experts that the lamp could have caused an ignition by fracture of the glass or by a spark occurring in the lamp socket, owing to the slackness of the bulb. Mr. Smithles, of the research department of the General Electric Company, said that the type of bulb used in the pencil lamp was not advocated for medical or surgical use. The lamp in its present condition was dangerous for use with an explosive mixture.

HOSPITAL ENTRANCE SCHOLARSHIPS.

THE medical schools of Guy's and St. Thomas's Hospitals, and the medical college of St. Bartholomew's Hospital have recently had under consideration the methods of award of university entrance scholarships, and are unanimously of opinion that, in the interests of medicine, scientific merit and attainments should be the determining factors. They have therefore agreed that their university entrance scholarships shall be awarded as a result of open competitive examination, and they have arranged to hold a common examination for the purpose. Each school offers annually a scholarship of £100 and an exhibition of £60, and the scholarships and exhibitions will be awarded by the deans of the three schools sitting in conference, after receiving reports from the examiners. The scheme will come into operation in July, 1932, when the examination will be held at St. Thomas's Hospital Medical School. Thereafter, the examination will be held at each of the schools in rotation. Candidates will, of course, be entitled to express their preference for any particular school and the stated preference will be taken into consideration when the scholarships are awarded. The scholarships will be open to students who have completed their examinations in anatomy and physiology in a British school or university outside the London metropolitan area.

ENDEMIC ERGOTISM.

Dr. Julius Kaunitz[1] points out that epidemic ergotism has been almost extinct since the end of the last century, owing to the more careful cleaning of the rye seed before planting and milling, and the long period of storage of the grain whereby the toxicity of ergot decreases. It has occurred to him, however, that some of the vaso-motor and trophic diseases such as thrombo-angiitis obliterans, Raynaud's disease, erythromelalgia, scleroderma, sclerodactylia, and dermatomyositis, may possibly be due to endemic ergotism. In investigating cases of thrombo-angiitis obliterans he has been able to find a good deal of evidence of the disease appearing in persons who consume rye bread. Moreover, in the other diseases mentioned—especially Raynaud's disease and erythromelalgia—the vaso-motor and trophic disturbances are the same as those found in ergotism. In his experimental work Kaunitz was able to produce both acute and chronic ergotism in fowls. In the acute stage the arteries near the base of the comb were found to be contracted and the media was swollen and hyaloid. The capillaries, on the other hand, were markedly dilated and contained stagnant blood which was probably the cause of the gangrene in the comb. In a more chronic case in which many of the vessels of the comb showed endarterial hyperplasia the comb was swollen to about twice its natural size, and showed vaso-motor and trophic changes. Kaunitz comes to the conclusion that owing to the known effects of toxic ergot more stringent prophylactic measures are advisable. He admits, however, that further investigations are necessary and that it is not at present proved that many cases of vaso-motor or trophic disease are due to ingestion of ergot.

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[1] Canad. Med. Assoc. Jour., April, 1931.

Arch. Intern. Med., April, 1931, p. 548.

HOSPITAL OPHTHALMIC CLINICS.

THE scheme inaugurated by the ophthalmic hospitals of London to provide consultations and, when necessary, glasses for persons of limited means has now received the official sanction of the Ministry of Health and of King Edward's Hospital Fund, the latter body giving its consent on the understanding that the hospitals are reimbursed for any administrative charges. The scheme originated owing to the hardship involved in refusing treatment to patients coming from a distance unprovided with a certificate from their approved society for ophthalmic benefit. Under the scheme insured persons entitled to benefit and certain other groups will be admitted to a private consultation by an ophthalmic surgeon at a fee of 10*s.* 6*d.* and the provision of any necessary glasses, after which they will be referred to local doctor or out-patient clinic for further treatment. Special evening clinics for this purpose have been established at the Central London Ophthalmic, Royal Eye, Royal London Ophthalmic (Moorfields), Royal Westminster Ophthalmic, and Western Ophthalmic Hospitals, the facilities at Westminster being available only for members of approved societies entitled to ophthalmic benefit and other insured persons willing to pay a fee of 10*s.* 6*d.* At the other hospitals members of the Hospital Saving Association and non-insured persons are eligible under certain conditions. The inauguration of the scheme has enabled the hospitals to emphasise the desirability that those who require an examination of their eyes should have it done by an ophthalmic surgeon. It is hoped that the same principles will be followed by other eye hospitals and departments throughout the country.

APPARATUS FOR ARTIFICIAL RESPIRATION.

THE University College Physiological Society met on Tuesday at the London School of Hygiene to see Prof. Philip Drinker, of Harvard, demonstrate his apparatus for prolonged artificial respiration. He soon convinced his hearers that something of the kind is a necessary part of hospital equipment, and we hope his visit will serve its purpose and draw attention to favourable reports which have appeared in the United States and Canada. In brief, the patient is put to bed in an airtight iron tank from which his head projects through a close-fitting rubber collar. An electrical pump, controlled by an attendant, rhythmically produces a small negative pressure within the tank, and this expands the lungs as in normal respiration. Conscious patients can eat, drink, and sleep while in the respirator, and portholes allow the attendant to change clothing or to hand in a bedpan. Where anything more elaborate is required the negative pressures may be increased for a few minutes so as to produce hyperventilation of the lungs and consequent apnœa. Removal from the tank for a few minutes is thus made comfortable and safe. Children with intercostal paralysis following poliomyelitis have been kept in the respirator for months until their normal muscular function has been restored, and the apparatus has also saved life in cases of electrocution, severe carbon monoxide poisoning, and incomplete drowning. A smaller tank has been devised for artificial respiration in infants and has been used with fair success in 30 cases of neonatal asphyxia. If the child does not breathe within a minute it is placed in the respirator and may begin to breathe spontaneously after as long as an hour. For poisoning in adults, Mr. Drinker was careful to point out, the method is not intended to take the place of Schafer's artificial respiration; it begins where Schafer's leaves off. But as Dr. G. P. Crowden, the chairman, remarked, there is room for additional means of treatment of accidental asphyxia, which causes about 4000 deaths every year in this country. At the close of the meeting Dr. Richard Ellis was able to give independent testimony to the great relief afforded by Drinker's respirator to children struggling for breath in poliomyelitis. We hope to give further details of the apparatus in a forthcoming issue.

THE Inter-State Post-Graduate Assembly of North America meets in London next week. Arrangements for the morning lectures, to be given at the house of the Royal Society of Medicine, will be found in our Medical Diary. In the afternoons visits will be paid to hospitals and institutions.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

C. O. Gange to be Surg.-Lt.

The following appointments have been notified:—Surg. Comdrs. A. C. Paterson to *Victory*, for R.N. Hospital, Haslar, for four months' general professional course; and O. D. Brownfield to *President*, for three months' post-graduate course.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt. J. B. Oldham to be Surg. Lt.-Comdr.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. G. A. Kempthorne, having attained the age for compulsory retirement, is placed on ret. pay.

Maj. G. F. Rudkin to be temp. Lt.-Col.

Maj. (temp. Lt.-Col.) O. R. McEwen to be Lt.-Col. vice Lt.-Col. G. A. Kempthorne.

E. Hicks, to be Lt. (on prob.).

G. A. M. Knight is granted a temp. commn. in the rank of Lt.

ARMY RESERVE OF OFFICERS.

Lt.-Col. C. H. Straton having attained the age-limit of liability to recall, ceases to belong to the Res. of Off.

TERRITORIAL ARMY.

Capt. R. H. Hadfield having attained the age-limit retires and retains his rank, with permission to wear the prescribed uniform.

Capt. W. A. D. Drummond, R.A.M.C., to be Divl. Adjt., 47th (2nd Lond.) Div. and Sch. of Instrn., vice Maj. D. W. M. Mackenzie.

Lt. R. McI. Gordon to be Capt.

I. G. W. Hill, (late Offr. Cadet R.S.M., Edinburgh Univ. Contgt., Sen. Div., O.T.C.) to be Lt. with seniority.

INDIAN MEDICAL SERVICE.

Lt.-Col. W. F. Brayne retires.

ROYAL AIR FORCE.

The undermentioned Flight Lieutenants are promoted to the rank of Squadron Leader: W. E. Barnes and C. A. Lindup.

SEAMEN'S HOSPITAL SOCIETY: ANNUAL REPORT.—The report for 1930 states that the expenditure was £106,241, and the receipts £99,065, and that the alterations to the Dreadnought Hospital are well under way. As a result of these works there is a heavy overdraft, and as soon as the times become more propitious the board will be compelled to make a special appeal to meet the expenditure. Extensive internal rebuilding and alterations at the Hospital for Tropical Diseases were completed during the year, and cost nearly £30,000. At the annual court of governors on May 12th, with Lord Lloyd in the chair, the Norwegian Minister thanked the society for its kindness to Norwegian seamen, and Mr. P. P. Cole, the senior surgeon, expressed the hope that they would this year be able to open wards for women and children, primarily for dependants of seamen.

SPECIAL ARTICLES

SOME SURGICAL ASPECTS OF FAULTY NUTRITION.*

BY ROBERT McCARRISON, C.I.E., M.D., D.Sc.,
HON. LL.D., F.R.C.P.,

COLONEL, INDIAN MEDICAL SERVICE; HONORARY PHYSICIAN TO THE KING; DIRECTOR, NUTRITIONAL RESEARCH, INDIAN RESEARCH FUND ASSOCIATION.

Freedom of Well-fed Animals from Disease.

THE Laboratories of the Indian Research Fund Association, devoted to the study of diseases associated with faulty nutrition, are located at Coonoor in the Blue Mountains (Nilgiris) of Southern India, 6000 feet above sea-level. Their location is fortunate, for the temperature is equable, never very hot nor very cold; the mean winter temperature rarely falls below 50° F., the mean summer temperature rarely reaches 80° F. A good deal of rain falls in these hills, Coonoor coming within the range of both the south-west and the north-east monsoon; the former brings with it only occasional heavy showers, while the latter may involve us in heavy rainfall during November, December, and January. But it is rare that a day passes without sun. I have been content with corrugated-iron sheds, roofs, and floors tiled, sloped, and adequately drained. I am fortunate also in having a large staff of attendants who are highly skilled, and it is possible to ensure ideal conditions of hygiene and exposure of the animals to sunshine the whole year round.

In these conditions there live some 1000 stock albino rats. I use on the average 1100 animals a year. The pairs are kept in roomy, netted-wire, screened, and straw-filled cages, and have the peace and comfort necessary for fruitful breeding. As a rule, five or six litters are taken from each pair; and the older animals are thinned out at the age of 2 years—a life-span said to correspond approximately to the first 40 to 50 years of life in man. The average number in each litter is eight, but litters of 12 are frequent and those of 15 not uncommon. The mothers invariably rear the whole of their young.

This stock is fed on a diet similar to that eaten by certain peoples of Northern India, amongst whom some of the finest physical specimens of mankind are to be found. The diet consists of whole wheat-flour, unleavened bread (*chapattis*) lightly smeared with fresh butter, sprouted Bengal *gram* (legume), fresh raw carrots and cabbage ad libitum, unboiled whole milk, a small ration of raw meat with bones once a week, and abundance of water both for drinking and washing purposes.

During the past two and a quarter years there has been no case of illness in this community of albino rats, no deaths from natural causes in the adult stock, and, but for a few accidental deaths, no infantile mortality. During this period I have, myself, performed complete post-mortem examinations on 1189 of these rats, ranging in age from the new-born to 2 years. In none have I encountered any macroscopical evidence of disease with the exception of an occasional cyst in the liver, containing tapeworm larvæ. Both clinically and at post-mortem examination this stock has been shown to be remarkably free from disease. Disease and death have been excluded, almost completely, by minute attention to three environmental conditions: cleanliness, comfort, and food.

High Incidence of Disease in Ill-fed Animals.

I wish now to turn to my experimentation-rooms. Here are the same corrugated-iron huts, the same cages, the same scrupulous cleanliness. Here the animals are exposed in the same way to the sun's rays. But they live in separate cages—as do the controls for each experiment—isolated from their fellows; they are thus less contented than their more fortunate kith and kin in the stock animal rooms; and they are more exposed to the effects of chill, since they cannot be given straw-bedding, though each evening they are given bedding of clean cotton-waste. The main regard in which they differ from the stock animals is in their food, which is always faulty in some way or another. Further, as my business is to learn, as far as I can, how the foods eaten by the people of India are related to disease, synthetic diets are used comparatively rarely and then only for special purposes. The materials entering into the various faulty dietaries are usually those in use by the people of India; sometimes actual Indian dietaries are used.

During the last two and a quarter years I have examined 2243 of these improperly fed rats at post-mortem examination; that is to say, during the same period in which I failed to find disease in the community of stock rats. The morbid states encountered included all forms of diseases (1) of the lungs; (2) of the nose and accessory sinuses, including (3) otitis; (4) of the upper respiratory passages (adenoid growths); (5) of the eye; (6) gastro-intestinal diseases (cancer of the stomach in two cases only); (7) diseases of the urinary tract; (8) of the reproductive system (including death of the fœtus in utero and premature birth); (9) of the skin (including gangrene of the tail or feet); (10) of the blood; (11) of lymph and other glands; (12) of the endocrine system; (13) of the nervous system—nervous instability and polyneuritis; (14) of the heart; and (15) œdema. Not infrequently animals are found to be suffering from more than one of these diseases.

I say nothing of diseases of the bones and teeth, since the diets were not specially designed for their production, but mention might be made of crooked spines and distorted vertebræ and of imperfect teeth. The list includes only those morbid states which I have myself seen; it has been prepared from the post-mortem records of the 2243 imperfectly fed animals. It is an experiment on a large scale extending over two and a quarter years. As controls there is a community of hygienically housed rats, fed on a well-balanced diet composed of natural foodstuffs, as described, so combined as to provide in proper amount and proportion all elements and complexes necessary for normal nutrition. On the other side, there is a community of rats, also hygienically housed but fed on ill-balanced diets composed mainly of cereal grains or cereal products and vegetable fats with little or no milk, butter, and fresh vegetables. I claim for this experiment that it proves conclusively that one-sided diets which are disproportionately rich in cereals and poor in animal fats, milk, and *fresh* vegetables are capable of inducing in albino rats a large proportion of the diseases included in our calendar of human ailments; I may add that of all the faulty diets I have used, that composed of white bread, margarine, tea, sugar, jam, preserved meat, and scanty overcooked vegetables—a diet in common use by many people in this country—proved to be one of the worst and most likely to be associated in rats with many of the morbid states I have mentioned, especially diseases of the respiratory and gastro-intestinal tracts.

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* Being an abstract of the first of two lectures delivered at the Royal College of Surgeons of England, May 18th and 20th, 1931.

Rats are not the only animals I use: guinea-pigs, rabbits, pigeons, and monkeys are also used. In them I have found many of the above-mentioned diseases and some others besides. Of the latter I may mention the following: prescorbutic states, scurvy, and duodenal ulcer in guinea-pigs; hyperplastic goitre in rabbits; epithelioma contagiosum, polyneuritis, and true beri-beri in pigeons; and ulcerative colitis in monkeys. Two conditions I have not, so far, encountered: gall-stones, observed by Fugimaki (1926), de Langen (1929), and others; and cataract, observed by Eckstein and Szily (1924).

In every species—pigeons, rats, guinea-pigs, rabbits, and monkeys—I have found the same thing: properly fed animals remain remarkably free from disease, improperly fed animals are remarkably subject to it. It is reasonable, therefore, to assume that the human species is no exception to this rule and that many of the ailments, to which man is erroneously supposed to be heir, are the outcome of his improper feeding, a general conclusion which I have been emphasising during the past 12 years. Some may hold that it is not possible directly to translate to human experience the results of an experiment such as that just described. This may be true if we seek to do so too rigidly and fail to take sufficient count of other environmental factors to which human beings may be exposed. But in general the results of an experiment of this kind do, in my opinion, apply to man, and point the way to a solution of many ætiological problems connected with his physical infirmities.

Vitamin A Deficiency.

In the above list of diseases there are many of interest to the surgeon. Sinusitis, adenoid growths, otitis media, gastro-duodenal ulcer, gynæcological ailments, certain types of goitre, and urinary calculus are some of them. At first sight it would appear that morbid states so dissimilar as adenoids and stone in the bladder had nothing in common; yet ætiologically they are not so far apart. All these surgical conditions were found to have this in common; they occurred in animals whose ill-balanced diets contained little or no vitamin A bearing food materials, such as raw milk, butter, cod-liver oil, carrots, and fresh green vegetables. In my hands these food materials, when suitably combined, have protected my animals from these diseases, and I do not doubt that in the hands of the surgeon they will go far to protect his human patients from them and facilitate their cure and non-recurrences after operation.

[The lecturer here pointed out that he laid stress on the food materials themselves rather than on any particular ingredient, believing that the elements and complexes of normal nutrition combined in Nature's laboratory in a way that cannot be satisfactorily imitated. In the materials on which his stock rats were fed, and on which, he said, some of the finest physical specimens of mankind were reared, he found that an insufficiency of vitamin A might occur and be responsible for the occurrence of surgical diseases. He showed a number of slides illustrating characteristic changes, and said that the sites in which these changes had been observed in experimental animals were the nares, larynx, trachea, bronchi, submaxillary glands, parotid gland, and the accessory salivary glands of the tongue and pharynx; the pancreatic duct, bladder, ureter, and pelvis of the kidney; the uterus and oviduct; the epididymis, prostate, and seminal vesicles; the conjunctiva, Meibomian gland ducts, cornea, lacrymal gland, Harderian gland, and the extra-orbital (lacrymal) gland; the thymus (Wolbeck and Howe, 1925); and the thyroid gland. He found the changes, he said, to occur more readily in growing animals and, though focal in distribution, to have no definite confines or localities. He observed that, since man's food is rarely or never wholly lacking in the factor, it is important to realise that the conditions could occur in animals fed on human dietaries containing insufficiency of vitamin A. The changes would be helped in their occurrence not only by all food faults, but by unfavourable environment, the interplay between nutritional and climatic or bacterial conditions being thus illustrated. He continued:—]

The varying occurrence and location of the changes due to vitamin A deficiency are among the most interesting things about them. Thus, in monkeys fed on a diet said to be complete in other regards, but lacking a sufficiency of vitamin A, eye changes, sinusitis, and mastoiditis, so common in rats, are, as E. B. Tilden and E. G. Miller (1930) have shown, conspicuous by their rarity. Twelve years ago (1919) I demonstrated that the colon was of all organs in monkeys the most sensitive to faulty nutrition; and the recent work of Tilden and Miller, while confirming this observation, re-emphasises the importance of vitamin A deficiency in causing the ulcerative colitis which is so conspicuous a feature in these animals. The monkey's colon is also very sensitive to deficiency of other vitamins (McCarrison, 1919); particularly of vitamin C "which causes a condition varying from local congestion and thickening of the mucous membrane to one indistinguishable from ulcerating sloughing dysentery" (F. P. Mackie and G. D. Chitre, 1928). In some of these respects man resembles the rat more than the monkey. Thus, he is very susceptible to the eye changes resulting from insufficiency of vitamin A bearing foodstuffs in his diet, if one may judge by the prevalence of keratomalacia in the Madras Presidency, and by its amenability to treatment by cod-liver oil (Wright). But I suspect that he resembles the monkey in the sensitiveness of his colon to food deficiency; the number of cases of ulcerative colitis of "unknown" cause (T. B. Menon. 1930) occurring in India is sufficient to justify this suspicion. But however the changes vary, either as to extent or location, they are always to be found in mammals of all species so far examined—rats, guinea-pigs, rabbits, and monkeys—and in man himself.

These changes are independent of infection, though infection is frequently superimposed upon them. Indeed, it is because of them that infection becomes possible, since they occur for the most part in "outside" coverings of the body: the respiratory passages, the urinary tract, the reproductive tract, the conjunctiva, the nasal passages, the ear, and the ducts of organs. They are breaches in the walls of the body's defences, through which the invading microbe may enter. In this sense vitamin A is "anti-infective"; but the "anti-infective" quality is shared with other vitamins—C, B, and D—though exhibited by them in other ways.

Two points of interest to the surgeon remain to be mentioned: (1) if rats, fed on a diet deficient in vitamin A, be artificially infected with a bacterium, such as the Breslau bacillus (paratyphoid), they usually die from the resultant infection. But some may live, and in them the infection persists in the lymph glands "for a very long time after the general infection has been overcome" (H. C. A. Lassen, 1930). It seems to me probable that chronic enlargement of lymph glands in childhood, due usually to infection of one kind or another, may often be due to such persistence of infection as a result of a vitamin A deficient diet. Further, it seems probable that the focal breakdown of the tissue defences induced by this deficiency may be concerned in the causation of those "septic foci" about which so much is heard of nowadays. (2) I have spoken above of breaches in the walls of defence against bacterial invasion consequent on the use of vitamin A deficient diets, and I have mentioned that other vitamins may also exercise an anti-infective action though exhibiting it in a different way. This way may not need the breaching of the walls but their scaling. I take the following from an unpublished manuscript which Dr. Lloyd Arnold, of the Department of Pathology and Bacteriology, Chicago, has recently sent me: "McCarrison has repeatedly called attention to the early appearance of digestive disturbances in vitamin deficiency studies. The pathological examination of the dead animals following avitaminosis experiments shows evidence of tissue changes due to infections of various kinds. We have found that one of the first demonstrable changes in avitaminosis is an alteration in the distribution of the bacterial life within the lumen of the intestinal tract. The bacteria ingested by the mouth are not destroyed in the usual manner, but remain viable for many hours within the contents of the whole length of the small intestine. The mixed bacterial flora of the large intestine ascend into the upper levels of the small intestine. There is a gradual and progressive loss of the power of the body-surface to control the microbic life existing in contact with it. These findings have been constant and hold for vitamin A, B, and D deficiencies. By the time the adult animals show a loss in body-weight or the young animals show a stationary weight curve, there is evidence of bacterial invasion of the mucosa of certain surfaces. These latter observations have been made by numerous investigators. We attribute the early inflammatory changes in the lining membranes of the eye, mouth, throat, alimentary tract, &c., to the loss of power of these body-surface coverings to regulate the bacterial flora in contact with their cells. This precedes evidence of invasion of the membrane by bacteria."

This statement, so amply demonstrated by Dr. Lloyd Arnold's investigations, calls to mind the contentions of Sir Arbuthnot Lane and Dr. Nathan Mutch in regard to infection of the upper reaches of the intestine consequent on chronic gastro-intestinal stasis, a condition which, as my own researches (1921) have shown, may be due to the consumption of faulty food from the "first bottle" onwards through life.

The function of vitamin A, so far as it is known at present, is thus to maintain the functional integrity of the cells covering body-surfaces, thereby preventing invasion of the organism by microbic agents. Here, however, I must re-emphasise the position which I reached more than ten years ago, and which all my subsequent work has but strengthened—that whatever the specific function of any vitamin may be, vitamins are but links in the chain of essential substances requisite for the maintenance and harmonious regulation of the chemical processes in the tissues, and their action must be considered in connexion with metabolism as a whole—i.e., in relation to balance of food ingredients in general, to organs of digestion, and assimilation and to endocrine regulation of metabolism. Their deficiency, like that of the other elements and complexes necessary for normal nutrition, leads to depreciation of cellular function: depreciation of cellular function is the foundation upon which disease is built (McCarrison, 1921).

Surgical Diseases and Faulty Nutrition.

[The lecturer said he would briefly mention some examples in surgical diseases associated with faulty nutrition.

Adenoids and Otitis Media.—Referring to slide demonstrations already made of adenoids in the trachea, he said that rats developed adenoid-like growths in the neighbourhood of the nasopharynx from faulty nutrition and asked if there was not here an analogy with growths in the nasopharynx of children. Of otitis media, he said that as a result of faulty food, deficient in vitamin A, pus might be found in the middle ear of 60 or even 70 per cent. of rats, and the frequency of the condition in rats when on faulty diet must recall the frequency of the condition among school-children in England and Wales, *improperly fed.]*

Otitis Media.—The probable nutritional factor in the causation of otitis media does not appear to me to have received the consideration it deserves. According to S. Hastings (1925) a high proportion of all cases occur before the fifth year and many before the first birthday. In 1923 no less than 46,000 children had ear trouble; while 90 per cent. of deafness in adults is due to preventable causes in childhood. Ponfick reported that of 100 autopsies in children under 4, who died from various diseases, 91 had evidence of middle-ear disease, and in only 10 of these was the trouble recognised during life. The causes giving rise to middle-ear disease interact with one another; they are squalid poverty—with its accompaniment of malnutrition—neglected catarrh, tonsils and adenoids, mouth-breathing and the after-effects of measles, scarlet fever, and diphtheria. My rats do not suffer from the three last; but my experience in these animals leads me to believe that the insufficient supply of vitamin A bearing foods may be responsible for middle-ear disease in children to an extent much greater than is generally believed.

Gastro-duodenal Ulcer.—Twelve years ago (1919) I recorded the occurrence of this condition in guinea-pigs fed on a scorbutic diet of crushed oats and autoclaved milk. Recently I have repeated this experiment with the same result; and in this later experience I have found duodenal ulceration at all stages of the process up to perforation (in one case), the resulting abscess being localised. Magee, Anderson, and M'Callum (1929) have observed similar conditions in calves fed on food deficient in certain essentials. Gastric and duodenal ulcer are extremely common in Southern India. An experiment was accordingly undertaken to test the influence of diet in the localities. Albino rats were used; and the experiment was continued for 675 days. Two diets were employed: one, resembling that eaten by the poorer class Madrassi and containing rice, red pepper (chillies), tamarind, a little fish, and *conjee* (rice water); the other, resembling that of the poorer class Travancorian and consisting largely of tapioca root, with rice, a little fish, red pepper, and rice water. Both these diets were very deficient not only in vitamins of the A, B, and C classes, but in other regards also. The diets were prepared and cooked as used. About this time I had occasion to examine at post mortem gangrene.[1] The discussion gave occasion for protests against such legal judgments as those to which Dujarier fell a victim, but it must be confessed that the attitude of medicine towards the law was reminiscent of that of the mice who, in solemn conclave, recommended belling the cat. Another subject to be discussed was that of motor-car accidents, and the numerous cases of abortion alleged to be due to such accidents. It was suggested that, in fatal road accidents, a post-mortem examination should in the future be just as obligatory as it is already in fatal criminal cases. Traumatic appendicitis also came in for discussion, as well as traumatic sarcoma and sudden death from inhibition coinciding with attempts at abortion. In connexion with the criticism of "death by inhibition" as being in such cases a nebulous and negative conception, Dr. Paul described a case of prolonged and profound syncope provoked solely by a simple hygienic vaginal douche in the absence of pregnancy.

RAINFALL AND INFECTIOUS DISEASE.

In a communication to the Académie de Médecine on April 21st, Dr. Paquet developed his thesis that the rainfall influences the evolution of certain infectious diseases, such as typhoid fever, scarlatina, measles, diphtheria, and tuberculosis. His studies referred to the department of the Oise in the 20-year period 1911–1930. The notifications of typhoid and paratyphoid fever showed marked differences from year to year, and when a graph showing the notifications month by month, was compared with a graph showing the rainfalls in the same periods during the 20 years under review, it became evident that the driest years were the worst typhoid years, and that the notifications tended to be most numerous a month or two after heavy rainfalls following a more or less prolonged drought. A rainy spring would be followed by much fewer notifications. The outbreaks of typhoid following heavy rainfalls after a drought were traced to pollution of wells due to a too sudden surface flushing with rain water. With regard to scarlatina, the annual notification again showed wide oscillations—from 556 in 1914, to 70 in 1918. A blunt peak lasting two or three years would be followed by a sudden fall which would either be continued in the following period, or would remain flattened out for some years. On certain occasions, sudden rises of the monthly notifications of scarlatina coincided with a period of exceptionally heavy rainfall. The annual variations in the notifications of measles showed even wider oscillations, with a maximum of 1500 in 1912, and a minimum of 95 in 1922. The tendency of measles to flare up every second or third year could be correlated with years with a heavy rainfall. Dr. Paquet also associated a high incidence of diphtheria in the autumn and winter months with heavy rainfall. Even in the case of such a chronic disease as tuberculosis, he has been able to establish a certain correlation between rainfall and mortality.

TINNED FOOD.

It is commonly believed that if tinned foods are adequately supplemented by vitamin-containing substances, all is well. This teaching was vigorously attacked by the explorer, Dr. J. B. Charcot in a communication to the Académie de Médecine on May 5th. He described a condition which begins among explorers with a slight œdema over the front of the tibia, whence it spreads to the rest of the limb, and later to the scrotum and abdomen. At the same time small red spots, like flea-bites, appear on different parts of the body. Large ecchymoses sometimes appear, notably over the large joints, and ulcers over the joints of the fingers, but ulceration of the gums is rare (Charcot has never seen such a case) and the patient's most pronounced symptom, is extreme lassitude, which ends in five to seven months in fatal cachexia. When, in such cases, the patient continues to eat preserved foods, even in small quantities, the administration of any number of vitamin-containing foods will not prevent the disease from pursuing its course inexorably. On the other hand, if the patient cuts preserved foods completely out of his menu, his symptoms will, even if severe, disappear in a few days, and he will be completely restored. Charcot related how during his second expedition in 1908–1910 he diagnosed scurvy in himself and a companion, and how they dosed themselves with lemon juice and ate fresh meat and adopted a general antiscorbutic régime without, however, dispensing altogether with preserved foods. Their symptoms became worse, and it was only when he was in dire straits, hardly able to walk, that Charcot reduced his dietary exclusively to fresh meat (seal). After what he described as a "débâcle urinaire formidable," his symptoms disappeared completely in four days, and he felt perfectly fit. His companion, who was put on the same régime, was cured in five days, the ulcers from which he was suffering disappearing without leaving the slightest scarring. Dr. Charcot is inclined to incriminate preserved fish as well as preserved meat in this disease which he describes as "la maladie des conserves."

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

AUTOMOBILE AND AEROPLANE ACCIDENTS.

SINCE it is impossible to determine the population exposed to risk in the automobile, we cannot say whether the air is yet safer than the roads. But it is evident that the trend is in that direction. During the 18 months ended Dec. 31st, 1930, there were more deaths from automobile accidents than were suffered by American forces during 18 months of the world war (50,900 to 50,510 respectively). The first quarter of 1931 has seen 6230 automobile deaths, according to records of the National Safety Council. Three specific violations of traffic regulations account for 68 per cent. of the 1930 accidents. They are: exceeding the speed limit, driving on the wrong side of the road, and failing to give right of way. About 90 per cent. of the killed and injured were victims of cars in good mechanical condition. Half of the fatalities occurred in collision with pedestrians. During the same year (1930) 400,000 passengers were carried in the air and 24 were killed. In the last four years the number of air passengers has increased 31 times, while the fatal air accidents have increased only four times.

BIRTH CONTROL.

The Public Health Relations Committee of the New York Academy of Medicine have been considering birth control in its relation to the medical profession. They find that the conservatism of the medical profession with reference to contraception has been justifiable, but that recent research in this field demands recognition. "The guidance of the public in sexual matters should be assumed by the medical profession wherever it naturally comes within the scope of their work." They regard the present importance of the work of the Birth Control Clinical Research Bureau as temporary. This bureau maintains a contraceptive clinic at which the attendance far outnumbers the total of patients attending the nine contraceptive clinics attached to hospitals in New York city. But the modern tendency is away from detached dispensaries. And in this case the association with a general hospital is all the more desirable since "lacerations, erosions, and displacements, calling for treatment or operation, are many and are frequently overlooked." A birth control clinic also offers opportunities for the detection of early cancer or communicable disease.

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[1] See THE LANCET, April 4th, p. 774.

The Public Health Relations Committee recommends: (1) that the Academy concern itself solely with the medical and public health aspects of birth control and not with its economic aspects; (2) that present contraceptive clinics associated with hospitals be continued and others established as the need appears; (3) that where an extramural clinic exists to meet a temporary need it should be staffed with men who have an adequate knowledge of gynæcology and with consultants available; and (4) that instruction in modern contraceptive measures and in the indications therefor should be introduced into the curriculum of medical schools and that post-graduate instruction should become available to practising physicians.

THE PRACTICE OF MEDICINE IN MEXICO.

The department of public health of the United States of Mexico finds that many of the foreign "physicians" who enter Mexico to practise medicine have obtained their licences either from a "diploma mill" or by some other irregular means. On the advice of the public health department the Secretary of the Interior has issued instructions to the immigration authorities to the effect that foreign physicians will not be permitted to enter Mexico to practise medicine unless they have been previously authorised to do so by the Department of the Interior. It is said that the difficulty which Mexican physicians are experiencing in making a living adds to the demand to exclude foreign competitors.

MEDICAL MEN AS ARTISTS.

More than 250 examples of painting, drawing, photography, statuary, woodcarving, and metal work by medical men were on exhibition this spring at the New York Academy of Medicine. This was the fifth exhibition of the New York Physicians' Art Club which invites all members of the medical profession who wish to do so to exhibit their work in the plastic or graphic arts. "With a few exceptions," writes Stephen Bourgeois in the catalogue, "most of the doctor-artists are in fact more interested in technic, in skill, in methods of composition, or colour arrangement than in actual expression, although they probably believe the contrary." The artist-critic is strangely surprised to find that the doctors are "inveterate optimists."

NEW YORK STATE HEALTH COMMISSION REPORTS.

The distinguished commission appointed last May by Governor Roosevelt has presented its preliminary report. If no recommendations are made for change in the essential structure or policies of the State department, it is not because Dr. Farrand and his fellow commissioners have overlooked any detail of administration. They make comprehensive recommendations for improving the efficiency of local health administration, stressing especially the wastefulness of the present abundance of local boards of health of which there are no less than 1036 in the State. This system of many small health units, designed by law to meet the conditions of 1850, in the opinion of the Commission fails utterly to meet the needs of 1931. The units are too small to provide the services which modern public health demands. Advances which have resulted from research in the prevention of disease necessitate the employment of trained personnel who will devote their entire time to protecting community health. Moreover, better methods of communication by reason of the telephone, improved highways, and the automobile, make it easier to serve the larger territory of a county than it was to serve a single town a half century ago. Throughout the country the county with full-time personnel is recognised as the best possible unit for satisfactory local health administration. In 35 States there are more than 500 county health departments, some of which have been in successful operation nearly 20 years. The Commission feels that this is the most vital matter it has had to consider, and urges that legislation be enacted substituting the county as the unit of local health administration in place of the town and village. Other recommendations include the provision of more space for sanatorium care of the tuberculous, and provision for treatment by the county health departments of venereal disease, whether the patient be indigent or self-supporting, infectious or not.

SOCIETY FOR RELIEF OF WIDOWS AND ORPHANS OF MEDICAL MEN.

THE annual general meeting of this society was held on May 13th, with Mr. V. Warren Low, the President, in the chair. It was reported that the total membership of the society at the end of the year was 285, made up of 160 life members, 124 ordinary members, and one honorary member. During the year six members died and seven new members were elected. On Dec. 31st, 51 widows and 12 orphans were in receipt of grants. One widow died during the year; since 1917, when she came on the fund, she had received £925 in grants, her husband having paid £31 10s. in subscriptions. The annual grant during 1930 was £75 to widows over 65 years of age, and £60 to those under 65. Each orphan under 16 years of age received £50. In addition a Christmas present of £10 was made to each widow and orphan. This present being dependent on the money available for distribution, was smaller than in recent years. A sum of £241 5s. was also paid to six orphans who had reached the age of 16, to enable them to continue their education at school or start on some professional or business career. The invested funds of the society now amount to £140,700, and the cost of administration was just under 6 per cent. of the total income.

The society is described as a "mutual provident benevolent association of medical men who at the time of their admission were resident within a radius of 20 miles from Charing Cross." Admitted under 40 years of age a member pays an annual subscription of two guineas. When three annual subscriptions have been paid his dependants become eligible for benefits. If under 30 years he may become a life member for a single payment of 20 guineas with immediate eligibility of his dependants for benefits. For his subscription of two guineas a newly married man obtains a guarantee that his wife and young children will, in the event of his early death, not be left unprovided for. Such an insurance on a commercial basis would, it is pointed out, involve very large premiums. Until success in practice enables a member to make provision for his dependants his subscriptions are of a potentially provident nature. When success in practice renders them ineligible for benefits his subscription becomes of a benevolent nature, safeguarding the fund for those less fortunate.

Further particulars and application forms for membership may be had from the Secretary of the Society, at 11 Chandos-street, Cavendish-square, W. 1.

THE DIFFICULT CHILD.

To the Editor of THE LANCET.

SIR,—In thanking you for your very appreciative notice last week (p. 1097) of the lectures of my colleagues and myself on the Difficult Child, may I take this early opportunity of dispelling an unfortunate impression left by one statement which it contains? The annotation states that "one of the peculiar features (of the method) . . . is that the home has become the peculiar province of the social worker, and the psychiatrist never sees the home and does not always see the parents." While the former statement with regard to the home is unfortunately true, the reports which the physician receives are usually very full indeed, and are deliberately detached in outlook. Any personal expression on the part of the social worker is eliminated, and where it creeps in it is usually rejected or treated as an interesting sidelight on the social worker's own temperament. This is by no means a negligible piece of oblique information. The statement that the psychiatrist does not always see the child is most misleading. Not only does he see the parents when they exist or are accessible, but he sees in addition as many members of the family as possible, sometimes uncles and aunts, who from time to time have played a part in the life of the child. Moreover, fully a third of the psychiatrist's time is spent in talks with the family. If this were not the case, the fears expressed in your annotation would indeed be justified.

All workers in this field are realising that the doctor must be the central exchange for the gathering in and interpreting of the data of each case. Failure to recognise this will leave the field ultimately for the social worker to interpret in terms of sociological categories which are still far from clear, and not in *biological terms which the broad medical standpoint* demands.—I am, Sir, yours faithfully,

EMANUEL MILLER.

Wimpole-street, W., May 18th, 1931.

DURACAINE IN SPINAL ANALGESIA.

To the Editor of THE LANCET.

SIR,—I believe the dose of novocain for spinal injections is not the most that a patient will recover from, but the least that will give effective analgesia. After quoting authorities who support my contention that from 150 to 200 mg. is a sufficient dose for a heavy-weight adult with a long spine, Dr. Falkner Hill says: "Yet this child of 6 received 200 mg. How is such a thing possible? The answer is that gliadin made it so." Why, this is just what I am complaining about! What evidence has ever been produced that gliadin delays absorption and prolongs analgesia? If this were the case I should have expected that an amount of novocain which by itself was formerly ineffective in the duration of analgesia, would with the help of gliadin now have become adequate. What are the facts? In order to justify the name Duracaine, the dose must apparently be increased beyond anything previously in use, and in most instances doubled.

If a 4 c.cm. ampoule were graduated in the middle, the top half labelled "planocaine" and the bottom half "duracaine," this would at least be logical and not misleading. Consider the small cross section and short length of the dura in a child 6 years of age. How much cerebro-spinal fluid bathes the thoracic nerve roots in this area? Probably much less than 10 c.cm., for this volume goes far to spread the roots of an adult woman with a short spine.

I will now display 200 mg. of novocain in a choice of strengths for Dr. Falkner Hill's inspection. It represents 5 c.cm. of 4 per cent.; $6\frac{2}{3}$ c.cm. of 3 per cent.; 10 c.cm. of 2 per cent.; $13\frac{1}{3}$ c.cm. of $1\frac{1}{2}$ per cent.; and 20 c.cm. of 1 per cent. What concentration of novocain would be required to give effective analgesia on the delicate nerve roots of a child of this age? Surely not nearly 7 c.cm. of 3 per cent.!

Dr. Falkner Hill cannot seriously suggest that a state of utter collapse to a pulseless condition is a good preliminary to a surgical operation. Or does he believe in the old time doctor's expedient "Ah Ma'am, you have got to be worse before you are better"? He states that duracaine is a very remarkable liquid, and with this I agree, for a close examination of the various conflicting rituals performed in the administration of these mixtures would lead anyone to suppose that they contained a kind of "ectoplasm" which reacts in a variable manner in the hands of different mediums. But there is a more credible solution.—I am, Sir, yours faithfully,

London, W., May 16th, 1931. W. HOWARD JONES.

SEASONAL VARIATION IN MAN.

To the Editor of THE LANCET.

SIR,—In the notice of my small book in your issue of May 9th (p. 1036), I observe that no mention is made of what is perhaps its salient feature, and as I cannot but think that this feature has significance perhaps you will grant me a few lines in which to explain it. Briefly, the hypothesis developed carries the implication, among others, that the group of phenomena following deficiency of fat-soluble factors (such as factors A and D) is to be thought of as resulting from the working of a normal functional process under abnormal conditions, the abnormal conditions which render this process morbid being the continuance of general functional activity—locomotion, digestion, excretion, &c. This aspect is unfamiliar at present. My point is that when it is entertained and reasoned upon, one begins for the first time to understand the type and sequence of the events characterising this group of disorders, and can even make successful predictions, of a specific kind, as to their nature; which, were the guiding idea without any truth, would be impossible. Predictions of this kind were made, while working out the thesis forming the subject of the book, years before the facts they required could be realised as such. I therefore have some confidence that this biological way of synthesising the morbid events in question will ultimately find favour, since it offers a possible interpretation where none now exists.

I am, Sir, yours faithfully,

Liverpool, May 10th, 1931. EDMUND HUGHES.

SYPHILIS AND YAWS.

To the Editor of THE LANCET.

SIR,—I feel that the myth about sibbens should be stamped out. Dr. Burke's expression in his letter of May 16th referring to sibbens, "I rather regard it as being an European type of yaws," is perhaps sufficiently damning in its faint praise of the idea that this disease, which occurred in Scotland and was described in 1765, was yaws. Anyone who will read the *whole* of the literature upon sibbens, and who is conversant with the accounts of the epidemics of non-venereal syphilis which occurred elsewhere (Mal de Sainte Euphemie, 1727; Pian de

Nerac, 1751; La Radezyge, 1758; Mal de la Baie de St. Paul, 1770; La Facaldina, 1786; Maladie de Fiume, 1800; Maladie de Chavanne Lure, 1829) and who has an up-to-date knowledge of yaws will, I am sure, be convinced without any doubt whatever that sibbens was not yaws and that it was syphilis.

I am afraid, too, that some of the arguments put forward by Dr. Burke in support of the duality of syphilis and yaws cannot be upheld as of any value. He states :—

> In contrast with syphilis the primary lesion of yaws is seldom genital, and it is usually preceded by marked constitutional symptoms. . . . In yaws there is little or no adenitis, the type of exanthem is single, there is great itching. . . . The one disease does not confer immunity against the other.

These statements need amendment. The primary lesion in syphilis among certain native communities may commonly be extra-genital; constitutional symptoms may or may not occur in yaws as in syphilis; adenitis may be quite common in yaws and itching absent. Many types of skin lesion have been described in yaws.

As regards immunity Dr. Burke would appear to be ignorant of the more recent experimental work on cross immunity.

I am, Sir, your faithfully,
HUGH S. STANNUS.

Wimpole-street, W., May 18th, 1931.

AERIS: A NEW NAME FOR LAUGHING GAS.

To the Editor of THE LANCET.

SIR,—I consider that a specific name of an attractive character has long been required for nitrous oxide and its admixtures with oxygen and small percentages of carbon dioxide. If we look carefully at its chemical composition, we find that only those elements which are present in the atmosphere are contained in it. I suggest, therefore, that the word *aeris*—i.e., "of air"—would be a scientific and euphonious designation for this most acceptable and beneficent anæsthetic. The word "gas" is a misleading generic term associated in the public mind with various unpleasant and irrespirable gases. Instead of the ideas "gassed in the war," "an escape of gas," "a gas oven case," "step on the gas," the new name would offer only that of breathing a refreshing and harmless air, which indeed well describes this pleasantest and safest of all inhalations for annulling pain.

I am, Sir, yours faithfully,
BELLAMY GARDNER.

Clarence Gate-gardens, N.W., May 9th, 1931.

APHTHOUS ULCERS.

To the Editor of THE LANCET.

SIR,—In your issue of April 4th (p. 777) Dr. F. A. Phillips asks for information about the treatment of aphthous ulcers of the mouth. At this institute we have found very successful an application of 8 per cent. zinc chloride solution to these areas, which have been previously dried with cotton or gauze; the solution is allowed to remain for a minute and followed with Talbot's solution of iodine. Usually one application will suffice. Occasionally a second application within 24 hours is necessary and in the most severe type a third treatment. Zinc chloride in this strength does not destroy the surrounding healthy tissue, as occurs with silver nitrate or other strong caustic. Talbot's solution is made up of zinc iodide 15 g., iodine crystals 25 g., glycerin 50 c.cm., and water 40 c.cm.

I am, Sir, yours faithfully,
JAMES E. AIGUIER, Ph.G., D.D.S.

The Thomas W. Evans Museum and Dental Institute,
School of Dentistry University of Pennsylvania,
Philadelphia, May 2nd, 1931.

SWEEPSTAKES FOR HOSPITALS.

To the Editor of THE LANCET.

SIR,—Perhaps it is the prospect of a deluge of sweepstakes that makes St. Thomas's Treasurer sceptical. It is doubtful if legislative sanction would be limited to hospitals alone. There are said to be 48,000 other charities. If but 5 per cent. of charities indulged in sweepstakes we should have 47 a week.

I am, Sir, yours faithfully,
RALPH B. CANNINGS,
Secretary, City of London Maternity Hospital.

May 18th, 1931.

WEST LONDON HOSPITAL.

AT the annual meeting Lord Phillimore pointed out that most of the hospital's previous records were broken last year. More than £73,000 was received for general purposes and the number of in-patients increased by 161. In the out-patient and casualty departments there were 58,000 more attendances than in 1929.

The seventy-fifth anniversary was the occasion of a festival dinner at the Guildhall on May 12th when more than 600 people attended. Prince Arthur of Connaught, the President, who took the chair, spoke of the opportunity of social service which was offered to the hospital in extending the benefits of its treatment to the "middle classes." For the past six years, he said, accommodation had been provided in private rooms for 26 paying patients, and experience had shown that there was a very real demand for such accommodation provided that the charges (including specialists' fees) could be kept moderate. The board had therefore decided that an additional 74 private rooms should be provided, bringing the total to 100. Hitherto, a charge of £3 5*s.* weekly had been made for a private room plus a further sum, varying in amount and assessed by the committee, for medical and surgical fees. When the new rooms were built a flat rate of weekly charges would be adopted. It would vary according to the patient's capacity to pay and would begin with a minimum of £7 7*s.* This would include operative and all other treatment, and once the charge had been assessed the patient need have no further anxieties about his bill. The private beds would be entirely self-supporting, said Prince Arthur, and any surplus derived from them would be devoted to the upkeep of the general wards. In view of the increase in the hospital practice, it was urgently necessary to find less cramped accommodation for the casualty, pathological, and radiological departments. The noise of the traffic in the Hammersmith-road made the wards no longer suitable for patients and these were to be transferred to the back of the hospital. At least £200,000 was needed to carry out alterations and extensions, which had been approved in principle by King Edward's Hospital Fund. Mr. Winston Churchill urgently pleaded the cause of the "black-coated man," who was, he said, least provided for in the giant scheme of national insurance in which this country led the world. The lack of intelligentsia—the man who could write a telegram and send it, the black-coated man—had in his opinion counted largely in the collapse of Russian armies. Sir Henry Simson and Mr. Justice McCardie also spoke. Later in the evening Sir William Wells, chairman of the board of management, was able to announce that £23,800 had already been raised.

ST. MARY'S HOSPITAL, PADDINGTON.—The King of the Belgians has become patron of this hospital in token of his gratitude for the services rendered to the Belgian army during the late war. Between 1914 and 1918 the hospital supplied Belgium with sufficient anti-typhoid vaccine to inoculate 840,000 people, and sufficient "antisepsis" vaccine for more than a million and a quarter persons.

OBITUARY

THOMAS R. GLYNN, M.D., F.R.C.P. Lond.,

EMERITUS PROFESSOR OF MEDICINE, LIVERPOOL UNIVERSITY.

WE recorded last week the death on May 12th of Prof. T. R. Glynn, who was for 40 years Professor of Medicine at the University of Liverpool. The event occurred at his house, Bryn Bella, Tremerchion, N. Wales, in his 91st year.

Thomas Robinson Glynn was born in 1841. He was the son of Dashpen Glynn, a well-known Liverpool shipowner, and received his early education in Liverpool and his medical training in London at St. Bartholomew's Hospital. He graduated in 1865 in medicine at the University of London and began his lifelong association with the city of his birth by election as demonstrator of anatomy at the Liverpool school of medicine, associated with the Royal Infirmary, and he was also elected assistant physician to the Childrens' Hospital and physician to the Northern Hospital. In 1871 he was elected to the medical staff of the Royal Infirmary, having taken the M.R.C.P.Lond. Just previously to this date, the beginning occurred of a remarkable development of Liverpool as a medical centre. The Royal Infirmary then contained some 250 beds, and students at the school attached were admitted to the practice of the hospital and also to the practice of the Liverpool Lock Hospital, attendance fitting them for entrance to the qualifying examinations. The movement to raise the status and improve the scope of the school, which was set on foot in 1869, was throughly successful owing to the exertions among others of the Bickersteths, Mitchell Banks, Reginald Harrison and Richard Caton, and with this energetic group Glynn became a valuable coöperator. As is well known the school formed part of the University College of Liverpool, founded in 1881, as a constituent body in the Victoria University. In Liverpool College Glynn received the chair of medicine. Eleven years later the powers and property of University College were transferred from the Victoria University to the new University of Liverpool, and Glynn succeeded to, or continued in, the chair of medicine in the new University, with the result that his tenure of the professorship lasted practically 40 years. During much of this time he lectured regularly on medicine in the medical school, being one of a band of notable teachers, several of whom have just been mentioned by name; while William Carter, Alexander Davidson, and Rushton Parker should be added to the list. Of Glynn, Prof. Hill Abram writes :—"His instruction in his lectures was largely based on bedside work, and to all of the students he was untiring in teaching the value of the correlation of the physical signs and pathological findings. Further, his instruction was so imparted that he was always to his students something more than the brilliant teacher; he was the congenial comrade, appreciative of a story and ready to cap it."

PROF. T. R. GLYNN.

[From a portrait by R. E. Morrison.

Prof. Glynn had a long and distinguished connexion with the Royal College of Physicians of London, where he was elected a Fellow in 1882. He served on the Council in 1907–1909, and delivered the Lumleian Lectures in 1903 and the Bradshaw Lecture in 1913. In the former he took as his subject infective endocarditis, and dealt mainly, almost entirely, with the clinical aspects of the condition, analysing the ætiology and going very thoroughly into post-mortem pathology, where his lessons were made clear to the audience by the handing round of drawings made by himself, exhibiting the lesions that had been discovered at autopsy. The University of Liverpool possesses an instructive series of Glynn's drawings of morbid conditions, notably of heart lesions, among which these illustrations are to be found. Ten years later he delivered the Bradshaw Lecture upon hysteria and discussed the alliance between hysteria and various groups of diseases, making distinctions between hysterical and neurasthenic cases. The teaching here, too, was closely associated with his long clinical experience at the Royal Infirmary. Glynn was elected Emeritus Professor in 1901, and in the same year he retired from the active staff of the infirmary, having reached the age limit, when he was elected consulting physician to the institution. Among the other of his numerous appointments, he was past president of the Liverpool Medical Institution and had held at different times the posts of chief medical officer at the Royal Insurance Company, medical officer to the Customs, consulting physician to the Woolton Convalescent and Hoylake Hospitals, the Liverpool Dental Hospital, and the Catholic Blind Asylum.

We have received the following appreciation from Dr. Charles Macalister :—"It is of the man himself and of the influences of his work and of his personality that I venture to add a few words of appreciation. It was not as a student of the school that I had the advantages of his teaching. As a young practitioner one soon realised that he was a master of clinical medicine, the dynamic power of whose teaching attracted those who were fortunate enough to be able to attend his clinic. Every man's life involves a history and, so far as our profession is concerned, it was the fact that Dr. Glynn was a great clinical observer and teacher which rendered his life so essentially valuable. He belonged to the days when specialism had not as yet split up the work of the physician. He taught general medicine, of which his knowledge was wide, on broad lines eminently educative not only in the way of impressing clinical facts but, importantly, in that of cultivating the principles of observing the meanings and associations of these facts.

"The value of his influence as a teacher is reflected by the circumstance that very many members of the hospital staffs were his pupils and they carry on the traditions of his work. To his immediate students, who were attracted in large numbers to his wards, he was an oracle whose word was beyond dispute. I recollect many years ago discussing a case with a young resident who had been one of his pupils. The house physician held very definite opinions about the case in question and, on inviting his reasons, his answer was 'Because Dr. Glynn thinks differently from most people about these cases,' or words to the same effect, which indicated that he meant to hold by the teaching of his master whatever others might think of the matter. I may give an instance of Prof. Glynn's quickness of perception illustrated by his noting an ill-looking boy in the out-patient department becoming distressed by a draught from an opening door. It at once occurred to him that the lad might be suffering from rabies which proved to be the case. When calling on Dr. Glynn last year I reminded him of the incident, which must have happened more than 40 years ago, and he was very interested to hear that I remembered it. His teaching was largely based on his knowledge of pathology and, at the Medical Institution and in his classrooms, his expositions were frequently illustrated by excellent water-colour paintings of specimens of fresh preparations and also of clinical conditions.

"Prof. Glynn's life was a busy one. A large consulting practice, added to his professorial and hospital work, afforded him little time for leisure. In the 'nineties it was thought hardly proper for any well-known citizen in a wide circle round Liverpool to die without being seen by Glynn or by another eminent contemporary physician. His temperament, however, was one of great activity and it would have been impossible for him to leave any time unoccupied, and busy as he was he found opportunities for cultivated studies. He was an artist of considerable merit, had a fine appreciation of colour, and produced many good landscapes which, in some respects, resembled those of Robert Fowler, R.I., a friend who was frequently his guest during the summer vacations. His work was at times exhibited at the Royal Liver Society meetings and the Liverpool Autumn Exhibitions. Further, he had a great love of music; he was an organist, he delighted in singing, and retained his singing voice even when he was over 80 years of age. His humour permeated both the professional and social sides of his life. He, Mitchell Banks, and Edgar Brown, were a never failing source of entertainment at social functions; at the Chester Medical Society's annual dinners, for example, the interchange of witty talk between these three was as much an annual event as the dinner.

"On the death of an old friend memories of the past crowd in to the mind, but it will be sufficient here to testify to the work of his long life, given to the establishment of indelible traditions; we mourn that we shall neither see nor hear again one who has been a devoted friend to, and a distinguished member of, our profession."

MEMORIAL TO A MEDICAL MAN.—The board room in the new block at the Boscombe branch of the Royal Victoria and West Hants Hospital is to be a memorial to the late Mr. Arthur Heygate Vernon who joined the surgical staff of Boscombe Cottage Hospital in 1890, and had been vice-president, chairman of the board, and chairman of the house committee of the Victoria Hospital. The new block will more than double the out-patients' departments and will provide about 40 private paying wards and accommodation for special departments. The cost will be £120,000, towards which £80,000 has already been obtained. Of the 4136 in-patients admitted last year, an increase of 34, there were 202 victims of motor accidents.

MEDICINE AND THE LAW.

Pay-beds at the Miller General Hospital.

ON May 15th Mr. Justice Farwell gave his decision on the application of the Miller General Hospital for South-East London to establish a scheme under which the number of pay-beds might be increased from 15. There had been an adjournment from the previous week in order that the court might be informed of the accounts for 1930. These accounts showed that the past year was exceptional owing to large windfalls in legacies and donations. Thanks to these and to income from the 15 pay-beds (at £7 a week each), which the 1929 scheme of the Charity Commissioners had sanctioned, there was a profit of over £2000 for 1930. The existence of a profit imperilled the success of the application to the court, because the court has no jurisdiction to interfere except in the case of an emergency involving the failure of the existing scheme. At the same time, though the hospital had not proved the emergency, the court would naturally not wish to wait till disaster occurred before taking action. Mr. Justice Farwell, after reasserting the expressed objects of the hospital "to provide free medical and surgical relief and assistance for and to the necessitous poor" of the district, and after emphasising the principle that these objects must not be interfered with, was willing to look at the average financial results over a period of five years. The average result was a considerable deficit and the court was satisfied that it was necessary to make some alteration of the scheme. The court sanctioned a temporary increase of the number of pay-beds from 15 to 20 for 12 months, with liberty for the management to apply afresh after that time. The beds would be in two wards, to be used primarily for paying patients only. The hospital had asked that where the doctors thought that paying cases required separate rooms the cases might occupy some of the eight separate rooms available for that purpose. This request also was sanctioned.

Fraud Charge against Psychologist Fails.

After several days' hearing before Mr. Justice Horridge and a special jury, allegations of fraudulent misrepresentation brought by a patient against a medical practitioner failed. The plaintiff's case was that, while she was undergoing psychological treatment by the defendant, he found out from her that she had over £3000 at her bank; he told her (it was alleged) that he was chairman of a certain company, falsely representing that the company had valuable sulphur deposits in the Eastern Mediterranean, that its prospects were wonderful, and that he himself had invested in it every penny he could spare. She said that, believing these representations to be true, she had invested £1000 in the company. The plaintiff also claimed damages for alleged negligence and for alleged breach of duty by the defendant as her medical adviser. On the other hand, the defendant denied all the charges and counterclaimed for his fees. His counsel described the action as a wicked and shocking conspiracy to draw a medical practitioner to the court on a charge of fraud in the belief that he would rather pay up than face a jury. Cross-examined by Sir Patrick Hastings, the defendant frankly agreed that the company had never paid a dividend, never earned a penny, and possessed no tangible assets. But he had done his best to explain the matter clearly to the plaintiff; he had done nothing underhand;

he had not tried to persuade her to put money into the company; on the contrary, he had mentioned the matter to her husband and had strongly advised against the investment. After evidence had been given on both sides, the judge summed up. He pointed out the serious nature of the charge of fraud; the case was "all or nothing." The jury found in favour of the defendant on all issues, but added an expression of opinion that the defendant was unwise in accepting from a patient money for a concern in which he was interested.

Allegations of Negligence against Surgeon Withdrawn.

On May 11th Mr. Justice McCardie approved the discontinuance of the action of Moore and wife *v.* Ligat, in which allegations of negligence were made against a surgeon. Mrs. Moore's claim arose from an accident which unfortunately caused her to lose the sight of one eye. She underwent an operation in 1927 for turbinectomy and a deflected nasal septum. She attributed her loss of sight to the use of undue force during the operation. The defence was that this was an occurrence which could not have been guarded against and was due to pre-existing disease. At a previous trial before Mr. Justice Horridge, lasted from March 31st to April 4th of last year, jury had disagreed. Plaintiff's counsel now stated that with a fuller knowledge of the facts than had been available in the earlier stages of the case, he had advised his client to accept an ex gratia payment (by which she would receive £75 clear) offered by the defence. The offer was in no sense an admission of the alleged negligence; counsel made it clear that all allegations of negligence were entirely withdrawn. Defendant's counsel explained that the surgeon's object naturally was to vindicate his professional reputation. That object had been attained and, as the defence was conducted by the Medical Defence Union, the defendant was not concerned in any matter of money. Mr. Justice McCardie assented with pleasure to the termination of the action; he was satisfied that all allegations had been withdrawn and he considered that the cheapest course had been followed. The result must certainly have been satisfactory to the defence. The hearing—it was stated—was likely to last four or five days. None of this expense, presumably, could have been recovered from the plaintiff, for whom leading and junior counsel were appearing under the Poor Persons Rules without fee.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

REGISTRATION AND REGULATION OF OSTEOPATHY.

On May 12th in the House of Commons the Order for the second reading of the Registration and Regulation of Osteopathy Bill was read and discharged and the measure was withdrawn.

This Bill was introduced by Mr. W. M. Adamson, the Member for Cannock, and obtained a first reading in the House of Commons on Feb. 11th. It is understood that the Bill was not regarded with favour by the British Osteopathic Association, and Mr. Adamson was not prepared to proceed with the measure unless there was agreement among osteopaths themselves.

HOSPITAL LOTTERIES.

In the House of Commons on Tuesday, May 19th, Sir William Davison asked leave to introduce the Hospitals Lotteries Bill, a measure to authorise the raising of money by means of lotteries for the support of hospitals. He said that he had sent to the Home Secretary a memorial signed by 70 Members of the House belonging to all parties asking him to take this matter into consideration. He had also furnished Mr. Clynes with the results of a questionaire which was recently sent out by the Special Appeals Committee of St. Bartholomew's Hospital to some thousands of representative people, including supporters of the hospital. The result of that questionaire to date was that 3125 persons were stated to be in favour of a lottery for the hospital and only 61 were against. Meanwhile, nothing was being done and British hospitals were in the greatest need of funds for building, equipment, and maintenance. He was aware that a number of Members of the House of Commons considered that hospitals should be a charge upon the State. But even they must surely realise in view of the statements of the Chancellor of the Exchequer in presenting his Budget that it was not practical politics in present financial conditions to provide State money for hospitals. The chairman of a large hospital, in a letter to the *Times* a few weeks ago, pointed out that hospitals were being seriously prejudiced by reason of the uncertain state of the law in regard to this matter, and he added that they were losing subscriptions both from those in favour of lotteries and from those who were opposed to them. That supported the view that it was time that this uncertainty of the law should be ended, at any rate so far as hospitals were concerned. Immense sums have been raised in Dublin in aid of the Southern Irish Hospitals.

AN UNAMBITIOUS MEASURE.

The Bill which he was asking leave to introduce was an unambitious measure. It did not attempt to modify or remove the many anomalies relating to lotteries, raffles, and sweepstakes. It was a short permissive measure which left the law as it stood until such time as the Government were in a position to deal with it. The Bill provided that notwithstanding anything in the existing law a lottery might be held under regulations to be approved by the Home Secretary for the benefit of British hospitals something on the lines of the Irish Free State hospitals lottery, but with improved regulations as a result of experience gained in the conduct of that lottery. This Bill would not refer to Northern Ireland. There was nothing inherently vicious in the idea of a lottery. It was bad for the country that the law should be openly broken by all classes, and with general approval, as it was being to-day. This Bill would be of immense benefit to the hospitals and through them to the sick and suffering people of the country.

ARGUMENTS IN OPPOSITION.

Mr. Foot, who opposed the Bill, said that it prejudged inquiry and demanded from the House a verdict before the evidence had been given. The Bill could not be limited to hospitals. If it was right for hospitals, it was right for the blind, for orphanages, and for every beneficent enterprise, national and municipal. This was a charity lottery which would not achieve its purpose, but would dry up the resources of charity. The man who would buy a sweepstake ticket would be tempted to feel that he had discharged his responsibility. In the Dublin sweepstake of November, 1929, £798,433 was raised from the sale of tickets, and of that sum £249,000 went in expenses and organisation, and £417,000 in prizes. Out of the £798,000 the hospitals took only £131,000. Out of each 1*s.* ostensibly raised to help the sick, 2*d.* went to the avowed purpose of the scheme. A short time ago the Earl of Onslow, at one time chairman of the Voluntary Hospitals

Commission, wrote to the *Times* setting out his reasons for condemning the proposal as disastrous to the financial interests of the hospitals of this country. The same opinion was given by the chairman of the Royal London Ophthalmic Hospital, and by Sir Arthur Stanley, Treasurer of St. Thomas's Hospital. The *Manchester Guardian* sought the opinion of 13 prominent members of the Manchester Hospital boards. Two declared in favour of the proposal, one was neutral, and ten declared against it. The House Governor of the Charing Cross Hospital, Mr. Philip Inman, in an interview this month, said that he and the hospital would have neither part nor lot in any such schemes. Their reasons were not simply moral ones, although they weighed very considerably. Looking at the matter simply from a business standpoint, they believed that the gains would be outweighed by the losses. This proposal, Mr. Foot added, screened cupidity with a thin smear of charity. The Good Samaritan would have taken a very different place in history if he had sought to discharge his responsibility to his distressed neighbour by spending his 2*d*. on the purchase of a ticket in the Jericho Hospital Sweepstake. Speaking a few weeks ago, Sir Alan Anderson, chairman of the Hospital Saving Association, said: "Illness is not a gamble, and it would not accord with the principles on which the Hospital Saving Association appeals to its members to base the finance of healing on the unstable foundation of gambling." The hospitals of this country ought not to be built on the very shifting and uncertain sands of chance and cupidity.

Leave to introduce the Bill was refused by 181 votes to 58.

WORKMEN'S COMPENSATION BILL.

On May 19th, in the House of Lords, Lord NOEL-BUXTON moved the second reading of the Workmen's Compensation Bill (which has already passed through the House of Commons). The object of the Bill was, he said, to repeal Section 9 of the Workmen's Compensation Act, 1925, and to substitute for it a new subsection. This subsection provided that if a workman had so far recovered from his injury as to be fit for employment of a light character, but had failed to obtain it, and it appeared to the county court judge that his failure was a consequence, wholly or mainly of the continuing effects of the injury, the judge should order that the workmen's incapacity should be treated as total incapacity resulting from the injury, and therefore entitled to continuing compensation. The Bill was read a second time.

HOUSE OF COMMONS.

WEDNESDAY, MAY 13TH.

Road Traffic Act and Public Safety.

Mr. FREEMAN asked the Minister of Transport whether he could make any report on the working of the recent Road Traffic Act; and whether it was securing increased safety for the travelling public.—Mr. H. MORRISON replied: To the best of my knowledge the provisions of the Road Traffic Act are working satisfactorily, but some time must necessarily elapse before their full effect can be judged. As regards public safety, I understand that the record of accidents in the metropolitan police district and the City of London show a reduction for the first quarter of this year of 10 per cent. in the case of fatal accidents and of more than 10 per cent. in the case of non-fatal accidents compared with the corresponding period of last year. The corresponding figures for the remainder of the country are not yet available.

THURSDAY, MAY 14TH.

The Sandstone Silicosis Fund.

Mr. NEIL MACLEAN asked the Home Secretary the cost of administering the sandstone silicosis fund for the last complete year; and the amount paid out in compensation during the same period.—Mr. CLYNES replied: It appears from the revenue account of the fund for 1930 that the total administrative expenses incurred in that year in connexion with the collection of levies and payment of compensation claims amounted roughly to £2700. This figure does not include the cost of the medical board or of the local joint committees which determine claims. These expenses, which amounted roughly to £7600 can hardly, I think, be regarded as expenses of administering the fund. The amount paid out in compensation during the year was £5580, odd, and the amount collected in levies was £48,715.

Teachers and Physical Culture Training.

Sir WILLIAM JENKINS asked the President of the Board of Education what facilities there were in England and Wales for training men in physical culture, and whether there was a sufficient supply of teachers to meet the demand in the schools; also what grants were being made towards physical training.—Mr. LEES-SMITH replied: Physical training is included in the course of every ordinary student at a two-year training college, and of a large and increasing number of graduates who take a one-year course of training. All the colleges referred to are aided by grant.

Epileptic and Mentally Defective Children.

Mr. ALBERY asked the President of the Board of Education what accommodation in public institutions was available for epileptic children in England; and what accommodation was available in Kent.—Mr. LEES-SMITH replied: There are six residential special schools for epileptic children certified by the Board of Education, providing altogether accommodation for 600 children. None of these schools is situated in Kent, but most of them admit children from any area. Provision is also made in certain institutions for mentally defective children for cases in which mental defect is combined with epilepsy.

Mr. ALBERY: Is the right hon. gentleman aware that there is a considerable shortage in accommodation and a very long waiting-list of patients, and can anything be done to remedy this state of affairs?

Mr. LEES-SMITH: I have made inquiries and I find that that is the case. At present the Board offers a grant of 50 per cent. to any local authority or voluntary association establishing these schools, and I hope that the result of that grant will be an increase in accommodation.

Bovine Tuberculosis in Man.

Lieut.-Colonel FREMANTLE asked the Minister of Health if he would arrange for the Ministry of Health Memorandum on Bovine Tuberculosis in Man to be issued as a Parliamentary publication and included in the Pink Paper.—Mr. GREENWOOD replied: This memorandum has already been published as a non-Parliamentary Paper, and it is available to hon. Members on application to the Stationery Office on the usual green form.

Captain PETER MACDONALD asked the Minister of Health whether he proposed to introduce legislation regulating the production and sale of milk with a view to reducing the incidence of bovine tuberculosis in human beings.—Mr. GREENWOOD replied: I am considering this question in consultation with the Minister of Agriculture and Fisheries.

Infant Mortality in London.

Mr. WEST asked the Minister of Health which three London metropolitan boroughs had the highest infantile mortality-rates.—Mr. GREENWOOD replied: According to the most recent available returns (1926–30) Paddington Stepney, and Shoreditch are the metropolitan boroughs with the highest infantile mortality-rates.

Claims of Married Women and Health Insurance.

Sir KINGSLEY WOOD asked the Minister of Health if he could give, for the last convenient date, the percentage of claims or other material particulars concerning the claims of married women on the funds of approved societies under the National Insurance Act; and how these compared with the original estimate of the Government actuary and the basis upon which married women's contributions were calculated.—Mr. GREENWOOD replied: The claims of married women have not in recent years been separately tabulated, but in view of the facts brought out in the report of the Government actuary on an investigation into the experience of a representative sample of the insured population (C.M.D. 3548) arrangements have been made for the separate tabulation of these claims in the future. In reply to the second part of the question, the report referred to showed that in the year 1927 the sickness claims of married women were 130 per cent. of the provision made by the valuation standard, while those of unmarried women were 117 per cent. In regard to disablement benefit the respective percentages were 171 and 119. In the case of both benefits the relative increase in the claims of married women over the previous six years had been much more marked than in the case of the unmarried. For a due appreciation of these figures it should be added that the valuation standard itself provides for a considerably greater amount of claims from the married than from the unmarried.

MONDAY, MAY 18TH.

Experiments on Living Animals.

Mr. FREEMAN asked the Home Secretary whether in the performance of experiments on living animals, who decided whether the experiment was calculated to give pain; and if the performer was the only judge.—Mr. CLYNES replied: No. In the case of this Act, as of all others, people have to consider for themselves whether what they propose to do is in accordance with the law; but if they infringe the provisions of the Act they are liable to have legal proceedings taken against them and the Court decides whether the experiment is or is not calculated to cause pain. Experience shows that people who propose to perform experiments which might by any possibility be regarded as calculated to cause pain are anxious to comply with the requirements of the Act in order to be on the safe side.

Factory Inspection in India.

Mr. DAY asked the Secretary of State for India the number of whole-time or part-time factory inspectors employed in India; and how many were women.—Mr. WEDGWOOD BENN replied: At the beginning of this year the number was 47, including one woman inspector in Bombay.

TUESDAY, MAY 19TH.

Patent Medicines.

Mr. HAYDN JONES asked the Minister of Health whether he proposed to introduce legislation to give effect to the recommendations of the Select Committee on Patent Medicines, whose report was issued in 1914.—Miss LAWRENCE replied: My right hon. friend fears that owing to the present state of business the Government are unable to undertake to introduce legislation on this subject during the present session.

ECCLES AND PATRICROFT HOSPITAL.—There is said to be a danger that, for lack of means, this institution may shortly have to close many of its beds, although it has a waiting-list of 300. The difficulty is officially attributed to the "refusal of the Lancashire insurance committee and the approved societies of financial support for the treatment of their members who are patients"; 61 per cent. of the in-patients come under this head.

INTERNATIONAL POPULATION UNION.—The second general assembly of the International Union for the Scientific Investigation of Population Problems will take place under the presidency of Prof. Raymond Pearl, at the house of the Royal Society of Arts, John-street, Adelphi, London, from June 15th to 18th. The first three mornings will be given to the business of the Union, but the afternoons will be available for reports and papers. The afternoon on June 15th will be devoted to Population and Food Supply. On the 16th Prof. F. A. E. Crew and Mr. Eldon Moore will introduce a report on Differential Fertility. On the 17th the Vital Statistics of Primitive Races will be considered, and on the 18th both morning and afternoon will be free for individual communications. Among countries to be represented are the United States, Belgium, Denmark, France, Germany, Great Britain, Holland, Spain, Sweden. The organising committee of the general assembly is the British Population Society, whose chairman is Sir Bernard Mallet. Application for tickets may be made to the hon. secretary, Mr. Eldon Moore, at Eliot Vale House, Blackheath, Kent.

ROYAL MEDICAL BENEVOLENT FUND GUILD.—A garden party in aid of the educational work of this Guild will be held in the Royal Botanic Gardens, Regent's Park, London, N.W., on Tuesday, June 2nd, from 2.30 to 8.30 P.M. The Duchess of York, *patroness of the Guild*, has consented to be present. The band of the R.A.M.C. will play; there will be hospital side shows and other entertainments; and purses will be presented. Tickets of admission may be had from the Hon. Treasurer, Mrs. E. D. D. Davis, 46, Harley-street, W. 1. Prices are reduced if they are purchased in advance.

The Guild, or women's branch of the R.M.B.F., has its offices at Tavistock House, Tavistock-square, W.C. 1, and coöperates by giving help to those beneficiaries of the Fund who are recommended to it by the Fund case committee.

The education of children and the subsequent training of students to earn their own livelihood are the Guild's special care, and in addition to fees paid, schools and training centres are recommended, and holidays also are arranged when necessary. The Guild raises its own funds and depends entirely on voluntary subscriptions and donations.

Medical Diary

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

The Society's house and Library will be closed from Saturday, May 23rd, to Monday, May 25th, both days inclusive.

TUESDAY, May 26th.—5 P.M., MEDICINE. Election of Officers and Council.

WEDNESDAY.—5 P.M., COMPARATIVE MEDICINE. Election of Officers and Council. Paper: Dr. G. P. Male: Gland Grafting in Veterinary Practice.

THURSDAY.—8.30 P.M., UROLOGY. Election of Officers and Council. Paper: Mr. A. Ralph Thompson: Further Considerations, Relative to Congenital Deformities of the Lower Urinary Tract.

FRIDAY.—5 P.M., DISEASES IN CHILDREN. (Cases at 4.30 P.M.) Election of Officers and Council. Clinical Meeting: Cases will be shown. 8 P.M., EPIDEMIOLOGY AND STATE MEDICINE. Election of Officers and Council. Paper: Sir William Hamer: The Crux of Epidemiology.

SATURDAY.—THERAPEUTICS AND PHARMACOLOGY at the University, Cambridge. Election of Officers and Council. Short communications: F. B. Parsons: The Action of Avertin on the Liver. S. E. F. Gooding: The Action of Radon on Isolated Tissues. E. G. Holmes and C. A. Ashford: Cerebral Metabolism. J. Heller: Sensitisation of the Uterus. W. E. Dixon and J. Heller: Some New Observations on Intracranial Pressure. N. Myers: The Treatment of Toxæmia. J. C. Hoft: The Action of Histamine.

MEDICO-LEGAL SOCIETY.

THURSDAY, May 28th.—8.30 P.M. (at 11, Chandos-street, W.), Dr. Nathan Raw: Dangerous Drugs. To be followed by a discussion.

LIVERPOOL MEDICAL INSTITUTION.

THURSDAY, May 28th.—4.30 P.M., Mr. D. McCrae Aitken: Principles of Rest and Exercise in the Treatment of Joints. (Hugh Owen Thomas lecture.)

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

INTER-STATE POST-GRADUATE ASSEMBLY OF NORTH AMERICA.

(Lectures in the Barnes Hall, Royal Society of Medicine.)

TUESDAY, May 26th.—10 A.M., Sir Thomas Horder: Some Medical Hints. 11 A.M., Mr. Donald Armour: Some Points on the Treatment of Head Injuries. 12 noon, Dr. J. Strickland Goodall: The Myocardium, with Special Reference to the Right Ventricle.

WEDNESDAY.—10.15 A.M., Mr. A. Lawrence Abel: Cancer of the Rectum and Cinematograph Demonstration of the Abdomino-Perineal Operation. 11.30 A.M., Mr. Victor Bonney: A Gynæcological Talk. In the afternoon of both days visits will be made to London hospitals.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.

TUESDAY, May 26th, to SATURDAY, May 30th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, M.R.C.P. Special evening lectures at 8.30 P.M. Tues., *Dr. W. J. Adie: Diseases of the Nervous System (II.).* Fri., Dr. W. J. Adie (III.).—CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W. Fri. Gynæcological operations by Mr. L. C. Rivett at 2 P.M. No fee.—HAMPSTEAD GENERAL HOSPITAL, Bayham-street, Camden Town, N.W. Fri., 2 P.M., Dr. H. V. Morlock: Some Recent Advances in the Diagnosis and Treatment of Pulmonary Diseases. Cases. No fee.—Further particulars from the Fellowship of Medicine.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

TUESDAY, May 26th.—Operations. 10 A.M., Medical Ward Visit, Dental Department. 11 A.M., Throat Operations. 11.30 A.M., Surgical Clinical Demonstration. 2 P.M., Medical, Surgical, Throat Out-patients, Operations, Medical Ward Visit.

WEDNESDAY.—Medical Ward Visit, Children's Medical Out-patients. 2 P.M., Medical, Surgical, and Eye Out-patients, Gynæcological Operations. 4.45 P.M., Venereal Diseases.

THURSDAY.—10 A.M., Neurological Department. 11.30 A.M., Treatment of Fractures. 2 P.M., Medical, Surgical, and Eye Out-patients, Genito-Urinary Department Operations.

FRIDAY.—10 A.M., Medical Ward Visit, Skin and Dental Departments. 12 noon, Medical Lecture. 2 P.M., Medical, Surgical, and Throat Out-patients. Operations.

SATURDAY.—9 A.M., Throat Operations. 10 A.M., Medical Ward Visit, Surgical and Children's Medical Out-patients.

NATIONAL HOSPITAL, Queen-square, London, W.C.

TUESDAY, May 26th.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Critchley: Cerebral Vascular Disease (4).

WEDNESDAY.—2 P.M., Dr. Martin: Out-patient Clinic.

THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Critchley: Cerebral Vascular Disease (5).

FRIDAY.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Mr. Julian Taylor: Trigeminal Neuralgia.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, Balham, S.W.

WEDNESDAY, May 27th.—4 P.M., Sir John Collie: Backache.

TIONAL COUNCIL FOR MENTAL HYGIENE.
WEDNESDAY, May 27th to FRIDAY.—(At the Central Hall, Westminster. Biennial Conference. The Human Factor as it effects International Problems, Crime, Industry, Social Services and Education.

JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY, 49, Leicester-square, W.C.
WEDNESDAY, May 27th.—5.30 P.M., Dr. S. Lomholt (Copenhagen): The Effects of Concentrated Ultra-violet Light upon the Skin and its Uses in Dermatological Therapy (annual oration). 7.30 P.M., Annual dinner at Kettner's Restaurant.

TY OF LONDON MATERNITY HOSPITAL, City-road, E.C.
THURSDAY, May 28th.—5 P.M., Dr. J. A. Willett: The Importance of Antenatal Care.

STITUTE OF PATHOLOGY AND RESEARCH, St. Mary's Hospital, W.
TUESDAY, May 26th.—5 P.M., Col. S. P. James: The New Method of Studying Malaria and Some of its Results.

SPITAL FOR EPILEPSY AND PARALYSIS, Maida Vale, W.
THURSDAY, May 28th.—3 P.M., Dr. F. L. Golla: Clinical Demonstration.

NDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE, Keppel-street, Gower-street, W.C.
WEDNESDAY, May 27th.—5 P.M., Dr. R. H. Crowley: Child-guidance.
THURSDAY.—5 P.M., Dr. F. C. Shrubsall: Mental Deficiency from the Social, Legal, and Educational Aspects.
FRIDAY.—5 P.M., Dr. N. Howard-Mummery: An Industrial Welfare Scheme.

NDON SCHOOL OF DERMATOLOGY, St. John's Hospital for Diseases of the Skin, Leicester-square, W.C.
THURSDAY, May 28th.—5 P.M., Dr. A. M. H. Gray: Sclerema.
FRIDAY.—5 P.M., Dr. W. J. O'Donovan: Tuberculosis of the Skin.

IVERSITY OF BIRMINGHAM.
WEDNESDAY.—4 P.M. (in the Large Theatre of the Medical Faculty Buildings, Edmund-street), Sir Hubert Bond: Some Correlations between General and Psychological Medicine. (Third of five William Withering Memorial Lectures.)
FRIDAY (at the Queen's Hospital).—3.30 P.M., Prof. Emanuel: Cases Illustrating Types of Cardiac Failure.

Appointments

RT, D. S. D., M.B. St. And., has been appointed Certifying Surgeon under the Factory and Workshop Acts for Thirsk.

Y, JOHN A. C., M.B. Edin., D.P.H., County Medical Officer to the Argyll County Council.

Vacancies

For further information refer to the advertisement columns.

ert Dock Hospital, Connaught-road, E.—Res. M.O. At rate of £110. Also Dental Surgeon.
rnet, Herts, Wellhouse Hospital. Asst. M.O. At rate of £200.
ckenham, Bethlem Royal Hospital, Monks Orchard, Eden Park.—Two Res. H.P.'s. Each £25 per quarter.
mingham, Highbury Hospital, Moseley.—Res. Asst. M.O. £300.
ckburn County Borough.—Asst. M.O.H. £600.
ckburn Royal Infirmary.—Fourth H.S. £150.
lton Infirmary and Dispensary.—Asst. Res. Surg. O. £200. Also two H.S.'s. Each at £150.
ighton, New Sussex Hospital for Women and Children.—Hon. Asst. Ophth. Surgeon. Also H.P. and H.S. Each at rate of £50.
ighton, Royal Sussex County Hospital.—Cas. H.S. £120.
rton-on-Trent, Bretby Hall, Orthopædic Hospital.—Locum Res. Asst. M.O. At rate of £350.
ry County Borough.—Asst. M.O.H., &c. £500.
rdiff, Llandough Hospital.—Med. Supt. £750.
rdiff Royal Infirmary.—Aural H.S. and Cas. Surg. O. Each at rate of £75.
rlisle County Borough.—Asst. M.O.H. £650.
ntral London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C.—Hon. Assts. to Out-patients' Dept.
elsea Hospital for Women, Arthur-street, S.W.—Jun. H.S. At rate of £100.
esterfield and North Derbyshire Royal Hospital.—Hon. Surgeon. Also Cas. O. At rate of £200.
y of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.
ty of London Maternity Hospital, City-road, E.C.—Asst. Res. M.O. At rate of £80.
ventry and Warwickshire Hospital.—Res. H.S. £125.
rby, Derbyshire Hospital for Sick Children.—Res. H.S. and Res. H.P. At rate of £150 and £130 respectively.
ncaster Royal Infirmary.—H.S. At rate of £175.
rchester, Dorset County Hospital.—H.S. At rate of £160.
eadnought Hospital, Greenwich.—H.P. and H.S. Each at rate of £110.
rham County Hospital.—H.S. £150.
st Ham Memorial Hospital, Shrewsbury-road, E.—Res. M.O. At rate of £200.
izabeth Garrett Anderson Hospital, Euston-road.—Ophth. Surg.
elina Hospital for Children, Southwark, S.E.—H.P. At rate of £120.
neral Lying-in Hospital, York-road, Lambeth, S.E.—Res. M.O. At rate of £100.
Gloucester, Gloucestershire Royal Infirmary, &c.—H.S. At rate of £120.
Golden-square, Throat, Nose and Ear Hospital, W.—Clin. Asst.
Grosvenor Hospital for Women, Vincent-square, S.W.—Gynæcologist.
Hammersmith Hospital, Ducane-road, Shepherd's Bush, W.—Res. Med. Supt. £950.
Hendon U.D.C.—Part-time Anæsthetist for Dental Clinic. 2 guineas per session.
Hospital for Sick Children, Great Ormond-street, W.C.—H.S. and H.P. Each at rate of £100.
Hove, Lady Chichester Hospital.—H.P. At rate of £100. Also Jun. H.S. £50.
Huddersfield Royal Infirmary.—H.S. At rate of £150.
Hull Royal Infirmary.—Third H.S. At rate of £150.
Ilford, King George Hospital.—Two H.S.'s. Each at rate of £100.
Inverness Royal Northern Infirmary.—H.P. At rate of £100.
King's Lynn, West Norfolk and King's Lynn Hospital.—Jun. H.S. At rate of £125.
Kingston-on-Thames, Kingston and District Hospital.—Second and Third Asst. Res. M.O.'s. At rate of £300 and £250 respectively.
Kingston-upon-Hull, Beverley-road Institution.—Asst. M.O. £300.
Lancaster Royal Infirmary.—Jun. H.S. £130.
Leeds Hospital for Women.—H.S. At rate of £50.
Leicester, City Mental Hospital, Humberstone.—Jun. Asst. Res. M.O. £400.
London, Female Lock Hospital, 283, Harrow-road, W.—H.S. at rate of £150.
London Temperance Hospital, Hampstead-road, N.W.—Cas. O. and H.P. At rate of £120 and £100 respectively.
Macclesfield, Cheshire County Mental Hospital, Parkside.—Asst. M.O. £350.
Manchester, Abergele Sanatorium.—Asst. Med. Supt. £600.
Manchester Babies' Hospital, Burnage-lane, Levenshulme.—Sen. Res. M.O. and Jun. Res. M.O. At rate of £125 and £50 respectively.
Manchester Ear Hospital, Grosvenor-square, All Saints'.—H.S. £150.
Manchester, Royal Children's Hospital.—Sen. M.O. for Out-patients' Dept. £300.
Manchester Royal Eye Hospital.—Jun. H.S. £120.
Manchester Royal Infirmary.—H.S. for Central Branch, Roby-street. At rate of £100.
Manchester, Withington Hospital.—Two Asst. M.O.'s. Each at rate of £275.
National Hospital for Diseases of the Nervous System, Queen-square, W.C.—Hon. Asst. Radiologist.
Newcastle-upon-Tyne, Hospital for Sick Children.—H.S. At rate of £100.
Nottingham General Hospital.—Cas. O. At rate of £200.
Oldham Royal Infirmary.—H.P. and Cas. O. Each at rate of £175.
Plymouth, South Devon and East Cornwall Hospital.—H.P. At rate of £120.
Queen Mary's Hospital for the East End, E.—Hon. Asst. Obstet. Surgeon and Gynæcologist. Hon. Neurologist. Res. M.O. and Cas. O. At rate of £200 and £150 respectively. Also H.P.'s and H.S.'s. At rate of £120.
Queen's Hospital for Children, Hackney-road, E.—H.P., H.S., and Cas. O. All at rate of £100.
Reading, Royal Berkshire Hospital.—Res. Anæsthetist. At rate of £150.
Rotherham Hospital.—Cas. H.S. £150. Also Sen. H.S. £200.
Royal Eye Hospital, St. George's-circus, Southwark, S.E.—Asst. H.S. At rate of £100.
Royal Free Hospital, Gray's Inn-road, W.C.—Res. H.P.'s and H.S.'s to Special Depts. Also Unit Anæsthetist and Cas. O. and District Obstet. Asst. £100.
Royal London Ophthalmic Hospital, City-road, E.C.—Six Out-patient Officers. Each £100.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—H.P. At rate of £100.
St. Mary's Hospital, W.—Cas. H.S. At rate of £100.
Salford Royal Hospital.—Hon. Dermatologist.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—Hon. Surg. to Out-patients.
Sheffield Children's Hospital.—H.P. and Third Res. M.O. At rate of £100 and £80 respectively.
Sheffield Royal Infirmary.—Hon. Asst. Surgeon and Physician.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—H.S. £150.
Truro, Royal Cornwall Infirmary.—H.S. £170.
Walsall County Borough.—Asst. M.O.H. £500.
West Bromwich, Hallam Hospital.—Res. H.S. £250.
West London Hospital, Hammersmith-road, W.—H.P. and two H.S.'s. All at rate of £100.
Westminster Hospital Annexe, 66, Fitzjohn's-avenue, Hampstead.—M.O. At rate of £300.
Windermere, Ethel Hedley Orthopædic Hospital for Crippled Children.—Res. H.S. £150.
Windsor, King Edward VII. Hospital.—Two H.S.'s. Each at rate of £100.
Wolverhampton, Royal Hospital.—H.S. At rate of £100.
Worcester General Infirmary.—Jun. H.S. £120.
Wrexham and East Denbighshire War Memorial Hospital.—3 Res. H.S.'s. Each at rate of £150.
York County Hospital.—H.S. Also Res. Anæsthetist and Asst. H.S. Each £150.

COMMONWEALTH FUND FELLOWSHIPS.—Among recipients of Fellowships granted by the Commonwealth Fund to enable British graduates to study in American universities for the two years beginning next September is J. H. Biggart, M.B., of Queen's University, Belfast, who is going to Johns Hopkins University.

MEDICAL NEWS

Royal College of Physicians of London.

At a meeting of the College on May 14th, with Lord Dawson, the President, in the chair, the following lectureships were announced: Lumleian (1932), Dr. C. E. Lakin; Goulstonian (1932), Dr. L. J. Witts; FitzPatrick (1932), Dr. James Collier; and Croonian (1933), Dr. W. E. Dixon.

A diploma in gynæcology and obstetrics was granted, jointly with the Royal College of Surgeons, to Wallace Freeborn, M.B. Sydney.

The College will be closed on Saturday, May 23rd and Monday, May 25th.

Royal College of Surgeons of England.

A meeting of the council was held on May 14th, with Lord Moynihan, the President, in the chair. The honorary gold medal of the College was conferred on Mr. G. Buckston Browne in recognition of his valuable contributions to the surgery of the genito-urinary system, and of his great liberality in the endowment of an institution for surgical research.

A diploma of Fellowship was granted to Alfred Richard Denis Pattison, of Durham University. A diploma in gynæcology and obstetrics was granted jointly with the Royal College of Physicians to Wallace Freeborn, M.B., Sydney. Diplomas of membership were granted to 161 of the 164 candidates whose names were given in our issues of May 9th and 16th (pp. 1059 and 1113) as recipients of the L.R.C.P. (excepting Inez E. Banner, W. Dodd, and Margaret M. White). In our previous list the names of S. G. Cimmering, G. I. Culank, and Lena Finkelstein should have been given as now printed.

The President reported that a vacancy on the Court of Examiners, caused by the retirement of Mr. L. Bathe Rawling, would be filled up at the meeting of the council on June 11th.

The Huddersfield Royal Infirmary was added to the list of hospitals recognised for the 12 months' surgical practice required of non-members before admission to the Final Fellowship Examination.

Royal College of Surgeons of Edinburgh.

At the last meeting of the College, with Dr. J. H. Ferguson, the President, in the chair, the following 23 candidates (out of 83 entered) who passed the requisite examinations between Jan. 5th and 13th were admitted to the Fellowship.

William Alistair D'Arcy Adamson, M.B. Edin.; Sundar Singh Ahluwalia, M.B. Punjab; George Lionel Alexander, M.B. Edin.; Alec Letts Dawkins, M.B. Adelaide; Harold Edmund Emmett, M.B. Manch.; Eric Leslie Farquharson, M.B. Edin.; Gerard Joseph Hanley, M.B. N.U.I.; Robert William Hendry, M.B. Aberd.; Richard William Johnson, M.D. Melb.; Isaiah Kallmeyer, M.B. Witwatersrand; Charles Herbert Leedman, M.B. Melb.; James Fraser Macdonald, M.B. Edin.; Leonard George McQueen, M.B. N.Z.; Bruce Toomba Mayes, M.B. Sydney; *Stanley James Granville Nairn*, M.B. Edin.; Belinda Elizabeth Nesbitt, M.B. Belf.; Papatla Pattabhiramaiya, M.B. Madras; Alan Alexander Pullar, M.B. N.Z.; Ian Monro Robertson, M.B. Edin.; Kenneth George Ward Saunders, M.R.C.S. *Eng.*; *William* George Eric Shand, M.B. N.Z.; George Drury Shaw, M.R.C.S. Eng.; Wilfred Charles Wickremesinghe, L.M.S. Ceylon.

The Bathgate memorial prize, consisting of bronze medal and set of books, was after a competitive examination in materia medica awarded to Norman Walter Nisbet.

Glasgow University Club, London.

This club is to hold its annual summer dinner at the Café Royal, Regent-street, at 7.30 P.M., on Friday, June 12th. Prof. Gilbert Murray is to preside. Any Glasgow University men who, though *not* members of the club, would like to attend are requested to communicate with the hon. secretaries, 62 Harley House, N.W. 1.

Committee on Welfare of the Blind.

In view of the continued development in work among the blind, owing to the operation of the Blind Persons Act, 1920, and the Local Government Act, 1929, and the new problems constantly arising in *connexion with this* service, the Minister of Health has reappointed the Advisory Committee on the Welfare of the Blind for a further period of office. The Committee has been *constituted* so as to afford representation to the local authorities concerned with the working of the Blind Persons Act, 1920, and to voluntary associations for the blind, as well as to organised blind workers. The Chairman is Lord Blanesburgh, and the members include Dr. Alfred Eichholz, Dr. S. J. C. Golden, and Dr. J. Middleton Martin. The Committee will advise the Minister on matters relating to the care and supervision of the blind, including any question *that* may be specially referred to them by the *Minister*. Mr. F. M. Chapman, of the Ministry of Health, will act as secretary.

University of London.

The Goldsmiths' Company has decided to offer, subj to the consent of the *Charity Commissioners*, which probably have to take the form of a scheme under Charitable Trusts Acts *confirmed* by Parliament, subject to certain other conditions, a sum not exceed £50,000 towards the cost of erecting and equipping library building of the new headquarters of the Univer in Bloomsbury. The University library, at present hou in the Imperial Institute, South Kensington, contains 260,000 volumes and pamphlets.

Congress of Comparative Pathology.

The second international congress of comparative pat logy will be held at the Paris Faculty of Medicine Oct. 14th to 18th, under the presidency of Prof. C. Acha Membership is open to doctors, veterinarians, and phy pathologists, and national committees have been constitu in participating countries.

Liverpool Medical Institution.

The fourth Hugh Owen Thomas memorial lecture will given in the Medical Institution at 4.30 P.M., on Thurs May 28th, by Mr. D. McCrae Aitken. His subject will "Principles of Rest and Exercise in the Treatment Joints."

University of Belfast.

It has been decided that the honorary degree of D. shall be conferred on Dame Louise McIlroy, professor obstetrics and gynæcology in the University of Lond Mr. Joseph Barcroft, F.R.S., professor of physiology in University of Cambridge, Maj.-General J. W. D. Meg director-general of the Indian Medical Service, and Hugh Hampton Young, professor of urology in Joh Hopkins Hospital, Baltimore.

Sweepstakes for Hospitals.

The governors of the Royal London Ophthalmic Hospi City-road, have ascertained the opinion upon the desirabi of sweepstakes for hospitals of those who contributed to i funds last year. Of those who answered, 59 per cen were opposed and 41 per cent. were in favour. Many o the latter based their assent on the ground that abnorm times justify abnormal methods; others agreed conditi ally that no loss of ordinary contributions would involved.

Hospital Out-patients.

The conclusions and recommendations of the Counc discussed on April 28th at a special meeting of th St. Pancras Division of the British Medical Associatio (see THE LANCET, May 2nd, p. 1001), were carried 14 votes to 9 at the annual general meeting of the divisi on May 12th.

Ladies' Medical Golfing Society.

The spring meeting was held on May 14th at Northwood Golf Club, Middlesex. The results were as *follows*:— Canny Ryall Challenge Cup: Mrs. Gordon Holm 90–19=71. Scratch prize: Miss M. Lett, 86. Handi prizes: First Division, 1st, Mrs. de Paula; 2nd, Mrs Ritchie. Second Division, 1st, Miss A. Bristow; 2nd, Mrs J. Gibson. Third Division, 1st, Miss S. Dudgeon; 2nd, Mrs Perry. Flag Medal Foursomes: 1st, Mrs. Gordon Holm and Mrs. Russell-Smith (beyond 20th hole); 2nd, Mrs Oldershaw and Mrs. Burn (19th hole).

University of Dublin.

The usual three weeks' post-graduate course for general practitioners will be given this year in the School of Physic Trinity College, and at certain clinical hospitals in Dublin from Sept. 14th to Oct. 3rd. Sir Edward Sharpey-Schafe will give the first John Mallet Purser lecture on June [illegible] in the medical school and has chosen for *his subject* The New Physiology. This lectureship was founded by Miss Sarah Purser in memory of her brother who held the chair of physiology in Trinity College and *was later* Regius professor of physic in the University. The lecture will be open to all medical practitioners and medical students. Among those who are to receive honorary degrees at the summer commencements, to be held on July 3rd, is Prof. Ariens Kappers, director of the Brain Research Institute at Amsterdam. Dr. Kappers has promised to give three lectures when he comes to Dublin for the ceremony, Sir John Rose Bradford, F.R.S., ex-President of the Royal College of Physicians of London, is to receive an honorary degree on the same day.

NOTES, COMMENTS, AND ABSTRACTS

EUGENIC STERILISATION.

EXPERIENCE IN CALIFORNIA.

THE fact is well known in this country that it is in alifornia that the experiment of eugenic sterilisation s been carried to the fullest lengths. A semi-opular book entitled Sterilisation for Human etterment,[1] describing the experiences of various merican States, was published in 1929 and briefly viewed[2] in our columns at the time. The original pers from which this summary was made have been llected in a single volume and are now available.[3] Up to Jan. 1st, 1930, a total of 10,877 operations r eugenic sterilisation had been performed in merica. Of these, 6787—nearly two-thirds of the tal and more than ten times as many as in any her State—were done in California. In several ates sterilisation laws have been passed and for rious reasons repealed. Of these reasons the mmonest has been that when compulsorily applied e measure is incompatible with the principles of dividual liberty which are laid down as the right every American citizen. There was in fact some certainty as to whether laws passed by separate ates might not be superseded by the Federal laws. 1927 however the question was settled in a anner satisfactory to advocates of eugenic steri-ation by a case from the State of Virginia which s carried through the Circuit Court to the Supreme urt of the United States, where the judgment of the rginian Court was confirmed by Mr. Justice Holmes.

THE QUESTION OF PROMISCUITY.

It has frequently been urged in opposition to the inciple of eugenic sterilisation that such a measure ould lead to an increase of promiscuity and to a ssemination of venereal disease. The results of the lifornian experiment indicate that this expectation not borne out when sterilisation is combined with thorough programme of parole and social after-care. questionaire relating to the effects of sterilisation on xual behaviour was sent to parole and probation ficers of the State and to the secretaries of associated arity organisations. These yielded 22 replies vering a total of 2154 women who had been observed om periods ranging up to 14 years, some of the ses being duplicated. In this series there were only lf a dozen instances in which the operation was ought to have contributed to sexual misbehaviour. o instances were observed amongst 3000 sterilised ales. The findings as a whole, it is claimed, compare vourably with those of other investigations of roled patients who have not been sterilised. The nclusions of the investigation are summarised in e following words:

> Under the conditions in which sterilised feeble-minded tients have been paroled in California, such parole does not nd to increase the amount of promiscuity in the popula-on, but greatly decreases it. The possibility of the spread venereal disease is decreased to a corresponding degree.

his contention is substantiated by a further claim that arriage without the responsibilities of parenthood exerts a stabilising influence upon defectives. Referring to a series of 124 marriages of defective girls whose course has been observed, the following statement is made:

> Had these girls not been sterilised, and had they promptly become mothers after marriage, it is not likely that so large a percentage of successes would have been recorded. Many of them who have the capacity to fulfil such responsibilities as wifehood involved in this social stratum would lack the capacity to take care of a steadily increasing number of children even if the husband were able to support the family. Unquestionably many of them, in view of their mental and emotional equipment, are not well qualified to bring up children successfully. On the other hand, freedom from childbearing enables these deficient girls to work outside the home with at least two useful results:—
>
> (1) They add to the family income, so that even if both husband and wife are economically not very efficient their joint earnings are adequate to support them comfortably; *and*
>
> (2) They are kept busy and out of mischief.
>
> Sterilisation, then, seems definitely to be a factor in the success of these marriages.

Stress is laid throughout on the importance of combining the system of parole and after-care with one of eugenic sterilisation.

RESULTS OF MATING.

The mean size of families of persons sterilised in Californian State Hospitals for the Insane is, for married men 1·64 living children, and for married women 2·03; for all men, including unmarried, 0·61 children, and for all women 1·85 children. The following conclusion is added: "In general, no large group of institutional insane in California will produce enough children wholly to reproduce itself even if it were not sterilised, the complete family being only two or three children. (Higher figures have been reported elsewhere.)"

An important conclusion of the recent Mental Deficiency Committee, which in 1929 reported upon the incidence of mental deficiency in this country, was that high-grade defectives were for the most part born of low-grade families which exhibited various forms of anti-social behaviour. The Californian investigation has resulted in a different finding, the discrepancy being probably accounted for by the very different social conditions which prevail in the two places. In the American investigation of the family status of the parents of defectives, no distinction was made between those which gave rise to primary and secondary aments. The *following* conclusion embraces both types:

> The fact stands out prominently that the institution is not kept filled by the progeny of the down-and-outers, the poor-house group, or even the unskilled labourers. It represents all grades of the population.

The following is a conclusion of an analysis of 126 marriages of 28 months' average duration after eugenic sterilisation.

> There was found to be no significant relation between the length of time that elapsed between the girl's first commitment and marriage, and her success in matrimony. This length of time represents the period when she was subject to control and discipline, was learning good habits or unlearning bad ones; it might be supposed that the longer this period of apprenticeship, the better would be her subsequent achievement. But the fact is not so.

The husbands of defective girls were classified in terms of the grade of the occupations of the husbands and a correlation was made between the grade of the occupation of the husband and the grade of defectiveness of his wife. It was concluded that "there is no tendency on the part of the superior husbands—i.e., those of higher Barr rating—to select more intelligent girls who were better behaved prior to commitment."

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[1] By E. S. Gosney and Paul Popenoe. London: Macmillan d Co. 8s. 6d.

[2] See THE LANCET, 1930, i., 60.

[3] The Human Betterment Foundation. Collected Papers on genic Sterilisation in California. Obtainable from Mr. E. S. sney, 26, N. Marengo-avenue, Pasadena, California; 8s. 6d. limited number of copies can be obtained from the Secretary the Eugenics Society at 20, Grosvenor-gardens London, S.W.1

EFFECT ON INDIVIDUALS.

Histories obtained from 65 normal men who had undergone vasectomy voluntarily, and whose subjective testimony was deemed reliable, showed that the operation resulted in no significant change in their ability to control the duration of coitus or in the frequency or pleasure derived from the act, or in any unusual sense of fullness or discomfort in the scrotum, or in any feeling of distension or lack of complete relief from the orgasm. In 13 of the cases both cut ends of the vas were ligated; in 50 the lower end was left patent, and in two the records are incomplete on this point. Rejuvenating effects claimed by Steinach to occur after the operation were not observed.

The volume contains many other observations of interest and the material is subjected to very thorough statistical analysis. That many of the sociological conclusions are inapplicable to this country is to be expected from the geographically unstable character of the population of California.

AID TO INVALID CHILDREN.

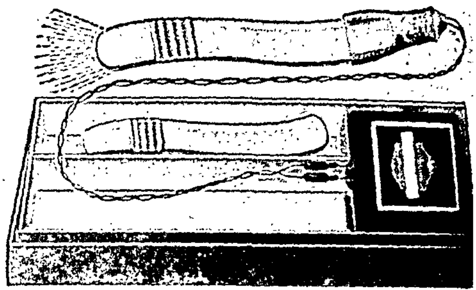
ADDRESSING the annual meeting of the Invalid Children's Aid Association, held at Londonderry House on May 5th, Sir Humphry Rolleston spoke of the value of the Association's work from the point of view of physicians and surgeons. Any doctor who had worked in an out-patient department would admit the difficulty of ascertaining why a particular child was jumpy, why [illegible] could not sleep, what was the cause of its ailing condition. The medical officer of an out-patient department could not go into the homes of his patients and find out the conditions there, but a wise visitor could give him much useful information which would help him in diagnosis and treatment. Social service in connexion with hospital practice had not been sufficiently utilised in this country, and the after-care given by I.C.A.A. workers in the homes was invaluable from the medical point of view. Lord Burnham, who presided, mentioned the satisfactory record of 1930. During the year new cases referred to the Association amounted to 16,023, while old and new cases helped had reached a total of 24,134, more than 7000 children having been sent away to convalescent homes. The Dean of Westminster emphasised the value of the voluntary spirit in work of this nature, and asked for offers of personal service. Mr. Hugh Walpole pleaded for the new areas growing up around London, for the dwellers in rows and rows of little houses all alike, all having about the same amount of means, and far removed from hospital facilities. The I.C.A.A. wanted to extend its work to places of that kind. Mr. Mitchiner went further, and said that families who had gone to live in the new districts had been driven back to London, in order to get the necessary help for crippled or invalid children. A plea for financial support was ably put forward by Dame May Whitty, and the usual resolutions, adopting the report and accounts, electing the council and executive committee for the ensuing year, and pledging the meeting to obtain the necessary financial support, were carried.

NON-STEAMING SPECTACLE GLASSES.

WE have received a pencil of "Clarocit," the function of which is to prevent condensation forming on spectacles. The pencil is to be rubbed with a circular motion on both sides of the lens which is then polished with a handkerchief, when it is claimed that the glasses will remain clear in any atmosphere for a period of at least 24 hours. The makers have testimony from medical men of its value when operating in hot theatres, which we can confirm from other sources. The pencils are made by The Clarocit Co., Ltd., 110, Gt. Portland-street, London, W.

THE "BRILITE" TONGUE SPATULÆ.

AN old method of illuminating microscopic object by means of a bent glass rod which, by internal reflecti conveyed the light from a dark chamber contai a lamp, has now been ingeniously applied t tongue depressor which has been put on the ma



by the Holborn Surgical Instrument Company, 26, Thavies-inn, London, E.C. In this case source of light is a small electric bulb, which concealed in a metal socket into which the gl tongue depressors are inserted. The light is conve along the blade of the spatula and out through end of it, giving a brilliant illumination. Spat can be kept ready sterilised, and a fresh one used each patient. The outfit shown in the illustra which is British made, consists of [illegible] spatulæ, and children's size, respectively, with lamp soc cords,—and battery in box [illegible] ral J. W is ma [illegible] Medical Servic

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Births, Marriages, and Deaths

BIRTHS.

BELLAMY.—On May 18th, at Welbeck-street, W., the wife of Dr. W. A. Bellamy, of a daughter.

INNES.—On May 17th, in London, the wife of L. Walrond Innes, F.R.C.S., of Windsor-villas, Lockyer-street, Plymouth, of a son.

McNAIR.—On May 13th, at Welbeck-street, W., the wife of Arthur J. McNair, F.R.C.S., of a daughter.

O'KEEFFE.—On May 16th, at Merstone, Tring, the wife of Dr. C. E. O'Keeffe, of a son.

ROOKE.—On May 12th, at Grove House, Runcorn, to Dr. and Mrs. Rooke—twin boys.

WOOKEY.—On May 13th, at Station-road, Hendon, the wife of Eric E. Wookey, L.D.S. R.C.S., of a daughter.

MARRIAGES.

EVANS—YARDLEY.—On May 14th, at Holy Trinity Church, Brompton, Thomas Charles Jameson Evans, M.A., B.Chir. Camb., to Mary Elizabeth, younger daughter of the late Frank Yardley, M.A., and of Mrs. Yardley, Solihull, Warwickshire.

ORMEROD—MARTIN.—On May 16th, at All Saints' Church, Woodford Wells, Essex, Thomas Laurence Ormerod, M.B., to Margaret Muriel Challis, second daughter of and Mrs. H. C. Martin, of Elm View, Woodford Green.

DEATHS.

BLAKESLEY.—On May 16th, suddenly, Henry John Blakesley, F.R.C.S. Eng., of Severn-street, Leicester, in the of his age.

CLOWES.—On May 10th, at Belsize Park-gardens, Hampstead, Dr. Herbert Alfred Clowes, aged 75.

DOBSON.—On April 29th, 1931, at Burley, Leeds, Dobson, M.D. Lond., aged 85.

GILLIS.—On May 14th, after an operation, Max David Gillis, L.D.S., D.D.S., formerly of South Africa.

GLYNN.—On May 12th, at Bryn Bella, St. Asaph, Robinson Glynn, M.D., F.R.C.P., Emeritus of Medicine, the University of Liverpool, aged

HIGGINSON.—On May 12th, after a very short illness, George Higginson, M.R.C.S., L.R.C.P., R.A.M.C.T., and Hon. Captain, Serbian Army, St. Sava and of the Serbian Red Cross, of Church Stretton, aged 63.

MACCONKEY.—On May 17th, at Lyndhurst, Blindley Heath, Surrey, Alfred Theodore MacConkey, M.B., D.Ch.

MILNER.—On May 12th, suddenly, at Reading, Milner, late of Bere Alston, Devon.

WALLACE.—On May 11th, at Pirbright, Surrey, Robertson Wallace, M.B., C.M. Edin.

N.B.—A fee of 7s. 6d. is charged for the insertion of Births, Marriages and Deaths.

DDRESSES AND ORIGINAL ARTICLES

TERNAL DISABLEMENT.*

IR BELL, B.S., M.D. LOND., F.R.C.S. ENG., P.C.O.G., HON. F.A.C.S.,
L AND GYNÆCOLOGICAL SURGEON, ROYAL INFIRMARY, ; AND PROFESSOR OF OBSTETRICS AND GYNÆCOLOGY IN THE UNIVERSITY OF LIVERPOOL.

LECTURE I.

OUGH for many years the obstetrical world ose boards and government departments which ncerned with the health of civilised nations roduced statistics, reports and memoranda to maternal mortality, isolated remarks only ound publicity regarding maternal disablement. at over 3000 women die annually in England and Wales, and that they die in similar or in even ster numbers in other countries, as the result of ations associated with childbearing is a distressing, it seems, that other eventualities otten, or are relegated to the background as lesser importance. It is generally believed aternal deaths are largely preventible, and be prevented. How much truth there is in sertion it is not my task to analyse to-day; may, perhaps, say that, since those deaths are where there should be rejoicing in the tion of a natural event, it comes about at even though the mother escape with her life ter grave difficulties have arisen, this happy issue liable to obscure subsequent disabilities which rsist, sometimes to "dog her footsteps" for life, metimes causing little immediate discomfort, yet ading to her death many years later. It is the gent, the dramatic, that affects: the long-drawn-out too often regarded as inevitable—a pleasing ternative to "something worse." So it is that each ar at least 60,000† women—that is, 10 per cent. of l mothers—are more or less crippled (for this is hat "maternal disablement" means) as the result childbearing.

It has seemed well, therefore, to explore as far as is t present possible this further burden of our women-ind—chronic ill-health, continued suffering, and, erhaps at some remote time that separates it from e immediate cause, death—in the hope that if ttention be focused on this pathological aspect of aternity some serious consideration may be devoted o organised prevention and treatment. With the ssistance of my gynæcological friends, I have had vestigations made—necessarily of a limited number f cases—to discover, so far as possible, the proportion f all parous women presenting themselves for reatment of lesions due to pregnancy and parturition r exacerbated thereby, in comparison with those uffering with other gynæcological disorders. Out of 275 consecutive parous women recently examined n the gynæcological out-patient department at the Royal Infirmary, Liverpool, no less than 775—that s, 34 per cent.—had lesions, constitutional or local, which were directly attributable to pregnancy and parturition and caused disablement. I am much indebted to my house surgeon, Mr. Arthur Bell, who collected these figures and made a full analysis of them. Unfortunately space forbids inclusion of the complete statistics here.

Such figures do not, of course, give an exact estimate of the damage that results from the exercise of the natural functions of reproduction. On the one hand, they represent only the more serious for which women seek advice; and, on the other, until we have standardised records of a number of pregnancies and labours of all kinds, with postnatal details—such as might be possible under an efficient national scheme—we shall never be able to obtain exact records of disablement, especially of that type of which the patient is ignorant or which she tolerates, for example, laceration of the cervix, a lesion that in the long run may be of vital importance.

It cannot be too clearly emphasised, as I have insisted elsewhere,[4] that the reproductive functions and processes are dependent on a woman's individual metabolism, and therefore are associated with her physical and mental functions. So it comes about that pre-existing pathological conditions may be accentuated, or lesions may be initiated by gestation, parturition and the puerperium.

It will be convenient first to group our remarks under these two heads, although there must obviously be some overlapping, and then briefly to touch upon the sociological aspects of motherhood, in so far as they affect maternal disablement, and on some of the general principles of prevention and treatment. Last of all, I shall venture to suggest an efficient organisation for the avoidance and alleviation of these disabilities, as well as for the reduction of maternal mortality.

In order to avoid repetition in regard to those lesions which may not only be pre-existent and adversely influenced by pregnancy, parturition, and the puerperium, but may also be brought into existence by these natural functions, it will be better to consider them at one and the same time.

Conditions made Worse or Initiated by Maternal Functions.

NERVOUS DISORDERS.

I shall make no attempt to separate the neuroses from the psychoses, for no doubt some of the former are partly dependent on loss of higher control—for example, chorea.

The most important true psychical disturbances are mental shock and puerperal insanity. The causal factors of these two conditions seem to be entirely different.

Mental shock is traumatic in origin, and resembles the state sometimes produced by a severe surgical operation. Crile and Lower[5] have shown that changes in the cells of the higher centres in the brain are visibly affected by severe trauma, when histologically examined, and that recovery may be slow. This condition is somewhat rare owing, no doubt, to the natural adjustments of the maternal mentality to the ordinary and inevitable unpleasantness and pain of parturition. It is only to be expected, however, that with the evolution of the human mind, and the apparently increasing difficulty of parturition, the mental resilience should occasionally be overwhelmed. Indeed, we should be glad, even though surprised, that this is not commoner. When the disaster occurs, it is seen, almost invariably, after the first confinement, and the condition may lead to serious consequences. The patient loses her *joie-de-vivre* and becomes apathetic. Towards her husband she becomes indifferent, and though she often has the normal maternal love for her child, she definitely

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* The Ingleby lectures delivered in the University of Birmingham on May 21st and June 4th, 1931.

† No exact figure can be given, but the statistics obtainable, and the yearly proportion of primigravida (1 1 : 4), make 60,000 a moderate figure in this connexion.

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avoids, if she can, further conception. Her bodily health may be quite satisfactory.

This condition is, I think, rarely seen when the pains of labour have been adequately controlled by anæsthesia. It almost always follows prolonged labour with severe pain borne, perhaps, with fortitude by a woman of high mental development. It is clear that if this tragic event were of more common occurrence the case for anæsthesia, at any rate in primigravidæ, would be made even stronger than it is at present.‡

Whereas mental shock may occur in an apparently healthy woman with no psychopathic family history, it is otherwise with *puerperal insanity*, for it is found that in about half of all such cases the patient has an hereditary psychical taint. Yet it is believed, almost universally, that there is always a determining factor of a toxæmic nature, such as that produced by a bacterial infection or chemical auto-intoxication, with which eclampsia may have been associated.

Puerperal insanity is not uncommon, for it has been found in one case in every 616 labours by H. J. Berkley,[5] and in one in every 1100 labours by R. Jones.[16] The disturbance, accompanied as it often is by homicidal and suicidal tendencies, is well worthy of more attention than is usually given to it, especially when we remember that some 30 per cent. of the patients fail to make a complete recovery, and that 15 per cent. die. Since this condition usually supervenes on a toxæmia in women with a psychopathic family record, it is of great importance that the psychological history should always be included in the antenatal history.

Of the neuroses we need only consider here *chorea gravidarum*. In this serious disturbance a past history of rheumatism, with or without chorea, in childhood is obtained in a majority of the patients, according to French and Hicks.[10] Wall and Andrews[23] concluded that strain and worry play a large part in the causation. The onset in half the cases is during the first three months of pregnancy, and the commonest age appears to be between 19 years to 24 years.[7] As Fletcher Shaw[22] states, chorea, which is probably of toxic origin, occurs in girls and young women at age-periods of irritability and instability. In patients in whom a maniacal psychosis develops death generally supervenes.

CARDIAC, VASCULAR, AND HÆMATOLOGICAL LESIONS.

Pre-existing lesions in this sytem are nearly all adversely affected to a greater or lesser degree by pregnancy and parturition.

The subject of *heart disease* in pregnancy and parturition is one which has received much attention at the hands of cardiologists since Mackenzie[18] first so carefully studied this question. The most recent contributions to the subject in this country are those of John Hay and of Crighton Bramwell. In 1928 Hay and Hunt[14] published a paper on Pregnancy and Parturition in Patients with Crippled Hearts, in which they described an investigation of 50 consecutive cases. Of these five died: all had mitral stenosis, two with slight aortic regurgitation, and in one there was auricular fibrillation and a "large white kidney." These authors call attention to the gravity of associated renal damage. Crighton Bramwell[6] recently based a paper on the study of 82 cases in which heart disease was associated with pregnancy. These were derived from 3000 antenatal patients, and three who had been sent as emergencies—that is, about 2·7 per cent. of all cases of pregnancy attending an antenatal clinic. Of the 82 patients five died. Bramwell was able to follow 66 of the women who got over the confinement safely, and found that in three at least the cardiac condition had been made much worse by pregnancy and parturition. Consequently about 10 per cent. of these patients lost their lives or were permanently disabled.

Leyland Robinson[20] has published an account of 18 cases of heart disease with auricular fibrillation, of which as many as 13 proved fatal as the direct result of parturition. These cases did not receive adequate, if any, antenatal care.

Arising out of this brief summary of recent work on heart affections and pregnancy, coupled with my own experience, I think it is clear that mitral stenosis, with and without aortic regurgitation, and especially when associated with auricular fibrillation, is a very grave disease in pregnancy. I myself have been impressed by the liability to a very sudden break in compensation during gestation without any warning—and this even though the patient be in bed and in hospital. Moreover, it is obvious from such figures as those of Robinson that uncared-for cases with fibrillation have but a small chance of surviving parturition. Renal complications add to the danger, and these may be due to a toxæmia of pregnancy. The greatest antenatal care with rest and good nursing seems to afford the best chance for these patients. The question of the artificial termination of pregnancy by induction or Cæsarean section may require consideration in many cases, but each must be judged on its merits. One advantage Cæsarean section with spinal anæsthesia offers over induction of labour is the opportunity for sterilisation. Whether any patient seriously crippled in this way, and further crippled by pregnancy and labour, should be allowed to face another conception in her disabled state is not difficult to determine.

Vascular lesions to which pregnancy may be assigned as an aggravative and also a causal factor are arterio-sclerosis following renal disease, pre-existing or the result of pregnancy toxæmias, and varicose veins of the lower extremities, the vulva and rectum. The former may, after the patient has passed a life of invalidism lead to death, and the latter may prevent a working woman from carrying out her duties.

Hæmatological disturbances, apart from secondary anæmia from excessive loss during parturition, need no consideration here. Stress must, however, be laid on the serious ill-health that may be associated with secondary anæmia in mothers, especially those of the working classes.

RENAL AFFECTIONS OF TOXIC ORIGIN.

Renal affections, whether due to a pre-existing nephritis or to a toxæmia of pregnancy, with or without the supervention of eclamptic seizures, are a very grave complication of pregnancy, not only in respect of the first gestation, but also because recurrence in subsequent pregnancies is likely; and, as we have seen, lesions of the kidneys militate against the chances of the mother when associated with cardiac abnormalities.

James Young[28] has found that severe toxæmias, with albuminuria and eclampsia, recur in 31·9 per cent. of subsequent pregnancies with added risks; and that if recurrent toxic albuminuria without eclampsia be superimposed the percentage of similar disability in subsequent pregnancy is raised to 57 More recent unpublished figures with which Dr mes Young and Dr. Elsie Crowe have kindly pplied me, show that the incidence of toxæmia 7790 patients examined in routine antenatal inics in Edinburgh is 6 per cent. of unselected cases that is, excluding those which are specially referred r this condition—and that about 40 per cent. of ese require admission to hospital. Further, they ve found that of 96 cases of pre-eclampsia and cases of hypertension, watched for an average me of eight months following childbirth, apparent covery took place in 40 per cent., and there was bsequent impairment in 60 per cent., and that the latter in 37·5 per cent. their health was shattered." In recurrent toxæmia there was impaired ealth in 73·5 per cent. of all patients, including shattered" health in 58 per cent.—a very high isability-rate. When eclampsia supervened there as subsequent impairment of health in 63 per cent. f the patients, including "shattered" health in 4 per cent.

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‡ I shall not refer here to the important condition known as obstetrical shock, which has recently been ably discussed by Miles Phillips, for this resembles ordinary surgical shock and is usually followed by death or recovery, and not by disablement.

A general average of all forms of disability due to xæmic causes, including associated accidental æmorrhage, in a total of 151 patients showed that 0 per cent. of all patients suffered with impaired ealth, a figure which included 31 per cent. with shattered" health.

Greenhill[13] found that 43 per cent. of a series of omen who had suffered with eclampsia were again fflicted with a similar condition in a later gestation. ibberd[11] noted that in 28 cases of albuminuria here was a toxæmia subsequently in 68 per cent. f those who conceived. Moreover, Gibberd states hat chronic nephritis may arise *de novo* as a sequel albuminuria of pregnancy. The frequency with hich this permanent damage occurs is stated to be 7 per cent. of all cases of albuminuria of toxæmic rigin. It is only to be expected, therefore, that the oman who already has chronic nephritis comes to regnancy damaged, and is likely to suffer further amage, with cardiorenal embarrassment, as the esult of additional stress produced by this function, f nothing more tragic occurs.

Prof. F. J. Browne, also, has been good enough to urnish me with some interesting and instructive igures on this subject. Of 38 patients suffering with clampsia or pre-eclampsia, 16 have subsequently hown evidence of chronic nephritis—that is, 42 er cent. Of 60 patients with albuminuria of regnancy eight had chronic nephritis—that is, 13 er cent. But of ten cases of accidental hæmorrhage, n none was chronic nephritis subsequently found. An insufficient number of Prof. Browne's cases have ubsequently become pregnant to allow conclusions o be drawn concerning the frequency of the recurrence f toxæmia in this series. We have, however, once nore evidence of the serious renal damage which is aused by severe toxæmias of pregnancy.

HORMONOPOIETIC SYSTEM.

Since there appears to be what I have described[2] as a "genital system of ductless glands" on which are dependent all the sexual functions, it is easy to nderstand that pregnancy may initiate derangements or influence pre-existing lesions in any member of this system. The chief organs with which we are concerned in this connexion are the thyroid and the pituitary. Concerning the other organs of internal secretion which may also be involved, for example, the ovaries and suprarenals, we have no evidence that they are directly and alone affected.

The Thyroid.—The clinical types of lesions of the thyroid with which all are familiar, are the toxic, including the exophthalmic goitre, the hyperplastic, and the hypoplastic. There is a certain degree of normal enlargement of the thyroid during pregnancy. This appears to be due to hyperplasia and increase in the colloid secretion. Sometimes the enlargement is considerably in excess of the normal and Bignami—quoted by Whitridge Williams[27]—has recorded a case in which this occurred in a first pregnancy, after which retrogression took place. In her second pregnancy the condition recurred, and the patient died of suffocation. I have recently seen a patient in whom exophthalmic goitre originated during pregnancy, but was greatly relieved by treatment with X rays, although a neurosis has persisted.

There is no difference of opinion concerning the exacerbation that may occur in goitres of toxic nature during pregnancy. Clifford White,[24] in 1911, in a critical review concerning exophthalmic goitre and pregnancy, labour and the puerperium, concluded that:—

> "Pregnancy is an important factor in the ætiology of the disease, and on the whole makes it worse. The patients may pull up lost ground towards the end of pregnancy, but are again made worse by the labour in a good many instances. Improvement during the puerperium is usual, and occasionally even a cure may take place. Relapses during subsequent pregnancies are to be expected."

White says nothing about fatal issues which have not been uncommon; but he calls attention to the liability to postpartum hæmorrhage. Seitz[21] in 1913 collected 112 cases of exophthalmic goitre of various grades, and noted aggravation in 60 per cent., and a fatal issue in seven patients.

Atrophy of the ovaries with superinvolution of the uterus has been noted in cases of thyroid disturbance, but may occur independently of recognisable lesions in that organ: I have seen a certain number of cases of this kind, and two are to be found among our 775 cases of maternal disablement. The condition is sometimes described as "lactation atrophy," and has, therefore, been observed when lactation has been unduly prolonged, as is sometimes practised in the poorer classes in the hope—often falsified—that conception may thereby be prevented.

The *pituitary*, as has long been known, shows great activity in the anterior lobe in pregnancy.[3] This may lead to symptoms and signs of acromegaly with glucosuria, and be followed by sterility and by a permanent change in the appearance of the woman.

Pancreas.—Although glycosuria occurs in the last few weeks of pregnancy as the result of the formation of lactose for mammary excretion, this should not be mistaken for glucosuria, which is seen only with disturbances of the pituitary and pancreas. I have already referred to the pituitary, and there should be no difficulty about the diagnosis of true diabetes.

Pancreatic diabetes is usually held to be a most serious complication of pregnancy. Williams[26] states that of 66 cases which he had collected from the literature, 27 per cent. of the mothers died at the time of labour or within two weeks afterwards, while a further 23 per cent. were dead within two years of the confinement. There is, moreover, the greater predisposition to infection[17]—a liability borne by all diabetics. Modern treatment with insulin and by dieting has to some extent reduced the danger of diabetes in pregnancy, but it is still one of the most serious constitutional complications.

BACTERIAL INFECTIONS.

Although pregnancy, parturition, and the puerperium are all responsible for the aggravation of chronic bacterial conditions, and may even determine adversely the outcome of acute infections, such as pneumonia and infective endocarditis, the local infections that may appear in the puerperium are nearly always due to the artificial introduction of organisms. In a few cases, however, the local lesions may be associated with septic infections of the ears, teeth, and elsewhere: this is known as auto-infection. These local infections we shall consider later. Infection from the vagina should not be regarded as auto-infection.

In the category which we are now studying I shall mention only chronic infections of the teeth, including caries, tuberculous lesions of the lungs (phthisis), and those of the urinary tract.

Dental lesions are of great importance, and a proper examination and hygienic treatment of the mouth is most necessary in practically every case during the antenatal period. As I have just stated, untreated dental infections may lead to puerperal sepsis, and, short of this, the mother may subsequently suffer the loss of teeth no longer amenable to conservative treatment.

Apart from infections, or superadded thereon, is the very common type of caries that is associated with gestation. This appears to be chiefly due to a disturbance of the calcium metabolism, which, in a sense, is normal to pregnancy. Throughout the whole nine months of gestation calcium is urgently required by the mother as an alkaline base to prevent acidosis, for cardiac and nervous stability, and for the integrity of her skeletal—including dental—structures. Too rapid and too great depletion may, and not infrequently does, lead to serious consequences in all these respects.

Depletion from the maternal tissues is due to the demands of the developing fœtus. Since the child obtains from the maternal blood about 70 g. of calcium in all, it appears that the mother must part with an average amount of 0·25 g. per diem throughout gestation, but probably as much as 0·6 or 0·7 g. per day during the last eight weeks, and less than 0·25 g. in the early weeks of pregnancy.

Dental caries must be considered both as to prevention by an ample supply of calcium to the expectant mother in milk or in other vehicles, and to treatment by temporary fillings, for it is a very common and most important antenatal disorder. Disregard of this condition leads to much subsequent ill-health, and sometimes to the mutilation of good looks.

Pyelitis and Cystitis.—According to Williams, Murray and Wallace,[25] between 25 and 42 per cent. of all gynæcological patients harbour in their urine colon bacillus; and no doubt a few have *Streptococcus fæcalis* also. In normal circumstances, that is to say, when the patient is in good health, these organisms cause no symptom. Whether in these circumstances they produce toxins or not, or how, if toxins be produced, they are neutralised is unknown. When, however, the patient is in ill-health, or when there is local irritation of the urinary organs, cystitis and pyelitis may supervene. Consequently, pregnancy may be associated with pre-existing bacilluria, with or without cystitis and pyelitis, and may aggravate these conditions or initiate them, by mechanical pressure, which may be very considerable with a retroverted gravid uterus, or by a lowering of the general resistance of the patient.

Pyelitis, the graver lesion, is far more common in pregnancy than is generally appreciated; but it is a complication of, rather than specifically associated with, pregnancy. It is more accurate, I believe, to speak of "pyelitis *in* pregnancy," than "pyelitis *of* pregnancy."

Prof. F. J. Browne has kindly sent to me the following particulars concerning 77 pregnant and puerperal patients suffering with pyelitis who were carefully investigated and followed; 41 were discovered in the antenatal period, and 36 in the postnatal. Of the antenatal patients 19 were cured—that is, there was no pus in their urines, and no growths were obtained on culture. Of the rest, 22 in number, 14 continued to have pus in the urine and organisms on culture. The remainder had organisms only. Six of the 41 cases have had subsequent pregnancies, and of these four have shown no evidence of pyelitis. Two have had pyelitis, but in them the condition had persisted between the pregnancies. Of the 36 patients in whom the lesion was discovered in the postnatal period, 20 were cured, and 16 were not cured in the sense given above.

In patients in whom there is persistent bacilluria, subsequent pregnancy, no doubt, as already indicated, may precipitate another attack of pyelitis. However, persistent bacilluria must be regarded in the light already given—namely, that it is present in many women even during pregnancy without producing symptoms, but should be regarded as a source of pyelitis in those whose immunity to the organism is lowered. Immunisation, therefore, should be practised to raise the patient's resistance.

Parturition, during which there may be prolonged pressure on the base of the bladder in the second stage, may so injure the tissues that cystitis supervenes, with or without a fistula forming. It must, nevertheless, be remembered that infection of the urinary tract not infrequently results from impure catheterisation, and that this is most likely to happen in the early days of the puerperium.

It is clear from these few remarks that infections of the urinary tract are often preventible, or may be amenable to prompt treatment.

Phthisis.—The effects of pregnancy and the puerperium on tuberculous lesions of the lungs have received a considerable amount of attention in recent times. In a discussion at the Royal Society of Medicine[10] this year attention was called to the statement of Rist, who recorded 52 cases of tuberculous (pulmonary) women who became pregnant. Of these 85 per cent. were made worse by pregnancy, and 50 per cent. had died within two years. Many other statistics were quoted by the speakers. These figures show that taking a large number of cases of the various types, deterioration occurs in about 45 per cent. of all the patients. It seems that when the disease is in an incipient or active phase pregnancy and the puerperium are dangerous periods; whereas when the disease is in a quiescent or healed condition little anxiety need be felt, provided the patient is well nursed, and is suitably fed in a healthy environment. In most cases, however, lactation should be forbidden, for this function leads to a continuation of the withdrawal of large quantities of calcium salts from the maternal economy—salts which are specially employed in reparative processes in connexion with infective lesions.

NEOPLASMS.

Pre-existing neoplasms, whether in the genitalia or elsewhere, may be considerably affected by pregnancy and parturition.

Malignant Disease.—It is commonly believed, in a somewhat general and vague way, that the growth of cancer is augmented by pregnancy, and this is the view of most clinicians. Although there are many contradictory statements to be found in the literature,[9] there can be no doubt that the matter has never been adequately investigated with proper biological perception. If, as I believe, the tissues of a malignant neoplasm show reversion to the chorion-epithelial type, we should expect that during the early weeks of pregnancy there would be acceleration, to be followed by stasis in the later months, with subsequent reawakening of active growth after parturition. This would correspond with the parental reaction to chorionic invasion; and, in my experience, this is what seems to happen.

We must all have observed the stimulation of a recurrence of mammary cancer by pregnancy—it is a phenomenon surgeons so dread that pregnancy is usually forbidden after operation or abortion effected. It is common to see, also, a great access of growth in a primary malignant tumour early in pregnancy to be followed later by quiescence, and after pregnancy by fresh neoplastic energy.

Innocent tumours, unless they be situated in the genitalia, are unaffected by pregnancy or parturition. Not so those in the genital organs and tract. These may be subjected to mechanical injury during pregnancy and labour, as a result of which sloughing may occur in them. I cannot here deal with the surgical treatment of these conditions; it is designed to prevent such serious consequences.

Degenerations, too, are common in fibromyomata, and may necessitate surgical treatment during or after gestation.

Creation of Local Lesions.

In this group we find the largest number of freshly created lesions due to parturition.

TRAUMATIC AND INFECTIVE LESIONS.

It is difficult to separate trauma from infection, for the latter so often follows lacerations.

At the Royal Samaritan Hospital, Glasgow, ætiological factors are recorded in the annual reports, and we find that in 1928 and 1929 63 per cent. of all the gynæcological lesions observed were due to parturition, and that 69 per cent. of all operations were performed for the lesions attributed to parturitional trauma and its results, and to infection. As, however, in a number of patients—roughly estimative from the difference between the total number of cases and the number of lesions treated—there was more than one abnormal condition present, we may correct the figures to read that about 48 per cent. of all lesions were due to infection and trauma, and that these were included in 51 per cent. of all operations performed—figures not very different from others which are mentioned below.

I am indebted to Dr. R. Newton, resident surgical officer, and to the honorary staff of St. Mary's Hospital, Manchester, for an analysis of the conditions found in 431 parous women presenting themselves in the out-patient clinic. In 185—that is, 43 per cent.—there were lesions attributable to pregnancy and parturition. Of these 185 lesions, 70 per cent. were due to trauma and infections. There were also 19 patients suffering with carcinoma cervicis.

Dr. G. H. Henderson, gynæcological registrar to the General Hospital, Birmingham, has been good enough, at the request of Prof. Beckwith Whitehouse and Mr. A. B. Danby, to send me the result of an examination of the case-cards of 500 parous women attending the out-patient gynæcological clinic at that hospital. From the records he has given me it appears that 157—that is, 31 per cent.—had lesions made worse or freshly created by pregnancy and parturition. Of these 72 per cent. were suffering with lesions due to trauma and infection. There were 11 also with carcinoma cervicis.

At the Royal Infirmary, Liverpool, I find that during the last six years 47·3 per cent. of all gynæcological operations have been concerned with the relief of local injuries and infections. Moreover, of the 775 disablements found in 2275 consecutive parous women (34 per cent.) seen in the out-patient department, suffering with disablement due to pregnancy and parturition, no less than 80·8 per cent. had traumatic or infected lesions. Among the remaining 148, out of the total of 775 cases of maternal disablement and its sequelæ, were 112 cases of carcinoma cervicis, leaving only 36 due to other causes.

These figures are summarised in Table I.

TABLE I.

Hospital clinic.	1	2		3		4	
	Parous women whose case-cards were examined.	With lesions created or aggravated by pregnancy and parturition.		With disability due to trauma and infection.		With cancer of the cervix.	
	Total.	Cases	Per cent. of total.	Cases	Per cent. of cases in Col. 2.	Cases	Per cent. of cases in Col. 2.
St. Mary's, Manchester	431	185	43	130	70	19	10
General, Birmingham	500	157	31	114	72	11	7
Royal Infirmary, Liverpool	2275	775	34	627	81	112	14·5
Total cases and percentages ..	3206	1117	34·5	871	78	142	12·5

Of the 1117 cases of trauma and infection shown in the above Table, only 169 cases—15 per cent.—were recorded as infections apart from cervicitis following laceration.

Disregarding the large number of acute infections, and taking into consideration only those found as subacute and chronic lesions in the pelvis in the postnatal periods, and putting aside infections of the breast and urinary tract, we have obtained the figures shown in Table II. from the total number of 775 cases of maternal disablement:—

TABLE II.

Cervix:	Chronic cervicitis	34
Body of uterus:	Chronic endometritis	2
	Abscess in uterine wall	1
Fallopian tubes:	Chronic salpingoöphoritis ..	74
	Subacute salpingoöphoritis ..	10
	,, pyosalpinx	16
	,, tube ovarian abscess	2
	,, ovarian abscess ..	3
Pelvic cellulitis	.. ..	15
,, ,,	with abscess	1
Pelvic peritonitis	.. ..	2
Thrombosis of pelvic veins	.. ..	2
		162

With regard to the 34 cases of chronic cervicitis shown in this Table, in them this was the only lesion recorded. As already indicated a large majority of all lacerations become in some degree infected, and are associated with other lesions, especially displacements of the uterus and vagina.

It is interesting to contrast with these British figures statistics which Prof. Essen-Möller has been kind enough to send me from Sweden. Out of 1000 consecutive cases confined in 1929, only three have subsequently sought relief for parturitional trauma, that is, 0·3 per cent. Again, out of 1000 consecutive parous out-patients there were but nine cases of trauma and four cases of infection due to parturition, that is, 1·3 per cent. It is true that retroversions and simple lacerations of the cervix are not included in these figures; nevertheless they bear out remarks I shall have to make later concerning obstetrics in Sweden.

Of the local lesions those resulting from trauma are, then, of the greatest frequency and importance. They may be encountered at the time of injury, or at a remote period, when the results of injury and often of subsequent infection become evident. These lesions concern the uterus and cervix, the vagina and adjacent organs—the bladder, ureters and rectum—and the perineum.

Rupture of the body of the uterus, as the result of manipulative interference, is not uncommon, but this catastrophe is related to the maternal mortality rather than to maternal disablement.

Not so, however, with lacerations of the cervix. Here we have an open wound which may become infected at once and cellulitis follow. More often we have the train of symptoms associated with chronic cervicitis, and in some cases the long-continued disablement pictured by James Young,[29] although such a serious state as a result of cervicitis alone is not, I believe, very common. Rather is it the ultimate result that may be serious—namely, cancer of the cervix.

Out of the 2275 parous women examined in my clinic, 139—6 per cent. of all the parous women investigated—had *bad* lacerations of the cervix, often, of course, associated with other lesions, and most of these cervices were infected, but it is probable that there were many more. Of 500 parous women examined in Birmingham, 43 are recorded as having badly lacerated cervices, but probably similar injury occurred in many of the cases of prolapse, but are not recorded. In Dr. Young's clinic in Edinburgh, out of a total of 1214 gynæcological cases, chronic cervicitis with and without other lesions, such as prolapse, occurred in 13 per cent. of parous women.

Still, we have no means of knowing how common are lacerations, especially the minor grades, of this part. It is believed that most primipara have some degree of cervical injury.

CARCINOMA CERVICIS.

In England and Wales about 4000 women die annually of cancer of the cervix alone, of whom at least 3800—that is, 95 per cent.—have borne children. It seems, therefore, that parturition, with cervical laceration and infection, is a very definite predisposing factor of malignant disease in this site—and it is the immediate effect of a single parturition rather than the result of repeated childbearing.[15] §

This annual death-roll should be added to the toll of maternity.

We have interesting and significant evidence of the value of the surgical treatment of the lacerated cervix in the figures published by Prof. W. P. Graves,[12] of Harvard University, and given below.

Cancer of the Cervix in Parous Women.

Number examined	488
Number in which repair of the cervix had been performed	9*

After-history of Cases in which Cervical Repair had been Practised.

Number examined	4815
Number in which cancer had developed subsequently	4†

* Operations performed many years previously and probably with poor technique.

† In two of these four cases there was evidence that the operation had been badly performed.

Strictly speaking, to complete the comparison we require to know also in how many untreated lacerations of the cervix malignant disease does not develop. Such figures have never been obtained and probably never will be, for the patients would require watching for the rest of their lives. Yet I hope the time will come when few lacerated cervices will escape treatment. I called attention to the importance of this over 20 years ago.[1]

As already stated, the large majority of all cases of cervical injury in which surgical intervention is practised are associated with lesions of the vagina and levatores ani, with various types of prolapse, or with puerperal retroversion. These conditions are most crippling, but fortunately are amenable to skilled gynæcological surgery. Fistulæ between the bladder and vagina and rectum and vagina, and complete lacerations of the perineum, also, are not uncommon.

Sociological Considerations.

I shall but briefly touch on the sociological aspect, for it is concerned largely with economic difficulties and with the evils attaching to poverty and ignorance. It is obvious that such conditions are more apparent in large towns than in country districts. Crowded homes, poor feeding, indiscriminate sexual intercourse, especially late in pregnancy, and the absence of personal hygiene and cleanliness are matters for serious consideration.

It goes without saying that the pregnant and puerperal woman needs good fresh food, with fresh air and sunshine. The development of our knowledge of the action of vitamins in relation especially to the anti-infective action of vitamin A, and the influence of vitamin D on the calcium metabolism make it imperative that pregnant women in the antenatal period should be provided with foodstuffs rich in these substances, and also receive daily at least one quart of milk which contains 1·0 g. of calcium in an available form; *this should give an adequate supply* of this essential element. All this is now well known and to some extent applied in connexion with antenatal work; but very often in the antenatal period it is too late to deal effectually with antecedent affections in early life which have seriously handicapped a woman's reproductive capacity.

Prevention and Treatment of Maternal Disablement.

The prevention and treatment of many of the constitutional and local conditions responsible for maternal disablement are difficult matters for, as I have just stated, the causal factors—for example, rheumatism and rickets—often go back to the early life of the woman concerned. In the ideal national health scheme the individual will be watched from the neonatal period through childhood to adolescence; rickets due to unhealthy environment, lack of sunshine, and bad feeding will disappear, and with it a considerable proportion of cases of contracted pelvis; imperfect pelvic development, too, will receive attention; orthopædic lesions of the lower extremities and back will be so managed as to obviate distortion of the bony canal; cardiac lesions will be prevented or treated early, and infections, which may produce permanent constitutional, such as renal, and local pelvic lesions unfitting women for maternity, will also be taken into account from this point of view.

No doubt much else can be done, but these are examples which indicate the necessity of long-continued care in the case of all women, for no one knows which will become mothers, all of whom should be in group A1, not in group C3, in a health classification. I believe that the fact that in Sweden most mothers are sound and healthy accounts almost tirely for the low rate of mortality and disablement that country.

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§ I am indebted to Sir George Newman for information on this subject.

I hold such considerations to be a most important art of any national maternity scheme, for, as I have ready said, antenatal observation is only of relative lue—great as that is—and postnatal investigations little more than enable us to discover and to repair me of the damage caused by pregnancy and rturition.

With regard to constitutional lesions discovered the antenatal period, there should always be rangements whereby experts can be consulted; many of the conditions are merely associated with egnancy, although adversely influenced thereby. lose coöperation in these matters can be secured ly in a perfectly organised scheme, and in relation large consultative centres. With these matters shall deal in my next lecture.

The prevention of the local injuries and infections, hich constitute at least 75 per cent. of all causes of aternal disablement, at present lies in the hands of te obstetrician and the nurse-midwife. Much can e done by careful antenatal anticipation, but even ore will be accomplished by ensuring the production a healthy maternal population. Meanwhile, good nd up-to-date midwifery must play an important ile. Such disregard as is shown by some of the equency of contraction of the outlet in otherwise ormal pelves, which leads to a large proportion of complete lacerations of the perineum, and such ck of knowledge or appreciation by most of the alue of efficient and proper massage and purification the vagina to prevent laceration and infection in fficult cases, and of *skilled* radiography, are clear dications that even the obstetrician himself may ave mental obfuscations concerning additions to our nowledge. No one of us is free from blame in this spect, and we must realise it in all humility before e attempt to apportion the responsibility for the rrible rôle of disablement that follows in the wake f motherhood.

Summary.

1. While 3000 women die annually in England and ales from the direct results of maternity, probably, t a most conservative estimate, 5000 die from the late sults of childbearing, including cancer of the cervix. hat is to say, more than 8000 women are lost nnually.

2. At least 60,000 parous women, also, are crippled nnually, many gravely, others, though less seriously jured, enough to cause ill-health and disablement.

3. Constitutional disorders form an appreciable percentage of all cases; and *they are more immediately* erious than local lesions, apart from acute sepsis.

4. Trauma and infection are often associated, nd comprise about 75 per cent. of all causes of isablement. In the present conditions with proper reventive obstetrics and by skilled reparative urgery the disablement from trauma and infection ould be much reduced.

5. To mitigate such a state of affairs as that escribed we must go further back than the antetal period, and ensure a supply of healthy mothers y watching women from the neonatal period of life o maturity.

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STUDIES ON NUTRITION IN RELATION TO IMMUNITY.*

A PRELIMINARY COMMUNICATION.

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FROM the earliest times it has been commonly believed that susceptibility to disease is affected by the quantity and quality of the food, and considerable justification for this belief has been afforded by the appalling increases in disease which followed many of the not infrequent famines throughout the ages. Modern work on nutrition with groups of animals on controlled diets is supplying more definite information. It has repeatedly been noted that susceptibility to infections, especially of the respiratory system and intestinal tract, is greater among animals on a deficient than on a complete diet, and such data as are available suggest that a similar connexion between diet and susceptibility to infection exists in human populations.

In studies on experimental animals it has been found that, when the diet is so deficient as to lead to the development of nutritional disease, changes occur in the tissues and body fluids which may be so marked that they can be detected by microscopic examination or chemical analysis. A well-known example is the abnormal level of serum calcium and blood inorganic phosphorus in rickets. These changes, when compared with observations on the incidence of disease in experimental animals on restricted diets, and on human populations under abnormal dietary conditions, afford evidence that the resulting perverted metabolism is accompanied by derangement of the defence mechanisms and reduced powers of resistance to infection.

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* This investigation was carried out under the supervision of a subcommittee of the Imperial Advisory Council, formerly the Civil Research Council. This subcommittee was appointed by the late Lord Balfour in 1926. On its recommendation a grant-in-aid for the work was obtained from the Empire Marketing Board. A number of workers have been engaged on the different aspects of the investigation. The chief part of the work on the investigation in Kenya was done by the late Dr. J. M. Henderson and Dr. J. W. Foster; the early work on sheep by Major Walter Elliot, chairman of the above subcommittee, and Mr. A. Crichton. Since 1929 the main workers have been Dr. A. H. H. Fraser and Mr. G. J. Jamieson, organisation of sheep experiments and clinical observations; Mr. D. W. Auchinachie, biochemical work; Miss E. J. M. Anderson, serology; Mr. W. A. Carr Fraser, of the Council of Scientific and Industrial Research, Australia, hæmatocytology; and Mr. W. Godden, chemistry of pastures.

Within the last ten years several attempts have been made to put this hypothesis to experimental test, and to ascertain whether derangement of metabolism, due to known defects in the diet, can be correlated with measurable changes in the defence mechanisms. The results of this work show that resistance to induced infection may be lowered on defective diets. So far, however, there is doubt whether deficiencies in the diet affect the antibody forming mechanisms in such a way as can be measured by our present methods.

The present position is thus as follows: it is generally believed that the nature of the diet is a factor in determining susceptibility to disease, and this has been confirmed in animals fed on deficient diets and subjected to incidental or experimentally induced infections. There is, however, as yet little definite information on the relative influence of different dietary constituents or factors in affecting susceptibility. Similarly, little is known regarding changes in the composition of the tissues or fluids of the body or of the normal metabolic processes accompanying lowered resistance. These questions are obviously of the utmost importance in both human and veterinary preventive medicine. Systematic research has little more than begun. There is likely to be in the immediate future a great increase in the volume of work on the many diverse problems being raised, and there is justification to expect that their solution will throw new light on the causation, prevention, and treatment of disease.

Present Investigations.

At the Rowett Institute feeding experiments are carried out with groups of farm animals. It has been noted that the increased susceptibility to infections, especially of the respiratory tract, which seem to develop in small laboratory animals on defective diets, occurs also in larger animals under similar dietary conditions. Such information as could be obtained regarding the incidence of disease in farm animals, on different rationing systems, or on pastures of different composition, have suggested that a similar relationship exists under ordinary farming conditions.

In 1926 arrangements were made for carrying out some large scale observations on this subject on both human beings and animals under field conditions. These observations were accompanied by studies particularly with reference to experimental animals under controlled conditions on the influence of diet on the state of health, on the chemical composition of the blood, and on immunological reactions. The survey on human beings, as originally planned, has been completed. An account of it is to appear in one of the special reports of the Medical Research Council. Hence only a very brief reference to this part of the work is given here. The investigation on farm animals is being continued and developed, and as it progresses papers dealing with its different aspects will be published from time to time. The present preliminary communication is intended to give a general account of the investigation as a whole, with an indication of the nature of results being obtained.

Observations on Human Beings.

A survey was made of the nature of the diet and of the incidence of disease in two East African tribes with very different dietary habits. The diet of one of the tribes consisted chiefly of cereals. The calcium intake was low. The vitamin content of the diet was not determined, but it is probable that there may have been a deficiency of one or more of the vitamins. The diet of the other tribe, consisting largely of milk, meat, and raw blood, though defective in other respects, was rich in those nutrients which were deficient in the diet of the former tribe. Table I. shows the probable average daily intake of the most important food constituents in the diets of the two tribes. It will be noted that the diet of the women is somewhat different from that of the men, and, in the cereal-eating tribe, appreciably better.

TABLE I.

—	Cereal-eating tribe.		Meat-eating tribe.	
	Males.	Females.	Males.	Females.
	g.	g.	g.	g.
Protein	99	140	300	165
Fat	22	20	160	95
Carbohydrates ..	390	400	100	245
Ca	0·28	0·46	2·94	2·63
P	3·0	4·4	4·36	5·19
Na	0·48	0·88	1·80	0·94

g. = grammes.

Samples of blood were obtained from members of the cereal-eating tribe, but owing to a tribal taboo it was impossible to get samples from the flesh-eating tribe on their natural diet. The average calcium content of the blood-serum in 90 natives was 9·4 mg. per 100 c.cm., as compared with 11·4 mg. in 13 Europeans living in the same district. It was found that the addition of calcium salts to the food resulted in a rise in average serum calcium from 9·2 to 10·0 mg. in the case of seven experimental subjects. There was thus evidence that a restricted calcium intake was correlated with a low calcium level in the blood-serum.

A survey of the incidence of disease taken in the native reserves showed that in the tribe with the cereal diet pulmonary conditions, bronchitis, and pneumonia accounted for 31 per cent. of all cases of sickness, tropical ulcers for 33 per cent., and phthisis for 6 per cent., compared with 4, 3, and 1 per cent. respectively in the tribe with the meat, milk, and raw blood diet. In this tribe the chief disease was rheumatoid arthritis, associated with chronic constipation.

The cereal-eating tribe suffered generally from heavy infestation with intestinal parasites. The diet of the women was, on the whole, less deficient than that of the men. It was therefore thought that, if defective diet favoured infestation, a difference might be found in the incidence of parasites as between men and women. An examination of the post-mortem records of 104 serial, unselected cases, showed that infestation was nearly twice as frequent in men as in women, and records of examinations of fæces at the Medical Laboratory showed 74 per cent. of men infected as against only 49 per cent. of women. It is recognised that these observations do not carry the same weight as the results of carefully controlled experiments, but they are in line with veterinary data collected elsewhere.

Owing to the death of the chief investigator in East Africa, the part of the investigation dealing with African natives has been suspended. This pioneer work has given results which warrant further inquiry. The poor physique, high incidence of disease, and the rather rigid nature of the diet in many of the African tribes make them a field of great potential value for the study of the subject.

Investigation on Sheep.

It was decided to carry out the main part of the investigation on sheep. The chief disadvantage in using this animal is the difficulty and expense involved in testing susceptibility to disease by the direct experimental method of induced infection. On the other hand, this animal offers many concrete advantages for the purposes of a research of this nature. Its size and docility allow blood to be drawn rapidly and in large quantity. This is very necessary where a number of biochemical and serological tests are being performed concurrently on the same individual. Further, sheep of standard breed and age are easily obtained, expert practical management is available, and epizoötic diseases do not introduce serious complications as in laboratory animals. Sheep are available in sufficiently large numbers to render statistical data (such as mortality percentages) of value, and at the same time are sufficiently large to admit of correlation between the clinical condition of any particular individual, and the biochemical and serological properties of its blood. On any large scale experiment on sheep, the basal diet must of necessity be pasture. An extensive investigation on the chemical composition of pastures, carried out jointly by the Nutrition Institute at Cambridge and the Rowett Institute, has now been completed.

In using sheep, therefore, the present research becomes a natural sequel to that recently concluded, the focus of interest being merely shifted from natural pastures to the naturally grazing animal. Knowledge obtained is of direct application to an animal of economic importance.

FIELD OBSERVATIONS.

An attempt was made to collect information with regard to the mortality of sheep in districts with pasture of different nutritive value. It was found difficult to get reliable data. Such information as could be obtained showed that mortality was higher on poor hill grazings where the pastures had an abnormally low content of inorganic salts, especially calcium and probably, of course, with deficiencies in other respects. It was recognised that there are other factors affecting mortality besides the probable influence of the amount and composition of the food.

During the years 1926 to 1928 tests were done on various hill farms to ascertain whether the supplementary feeding of substances thought to be deficient in the pastures would be followed by improved nutrition and decreased mortality. Groups of sheep were given from ½ to 1 oz. per head per day of a mixture containing mineral salts, cod-liver oil, and a protein-rich foodstuff. These tests were complicated by the handling of the sheep for commercial purposes, and the data were largely statements by shepherds which could not be checked. Results seemed to indicate, however, that in areas where mortality was high, improved nutrition accompanied decrease in mortality following the supplementary feeding.

OBSERVATIONS UNDER CONTROLLED CONDITIONS.

By 1929 the results were considered sufficiently promising to warrant making provision for work under more exact conditions. A sheep farm, on which the nutritive value of the pasture was low and the mortality high, was taken over, along with the existing stock, so that the workers might have complete and continuous control of the animals.

Clinical.—Clinical observations, including weighings, chemical analyses of the blood for calcium and inorganic phosphorus and various other constituents, certain serological tests, and determinations of the cell and hæmoglobin content of the blood, were made concurrently at intervals throughout the year on sheep under natural conditions on the farm. Similar observations were also made on young sheep which had been removed from the farm to Aberdeen in the autumn, and grazed during the winter on pasture of better composition.

It was found that there was a remarkable progressive decrease in weight during the winter in the young sheep—*i.e.*, those born in the previous spring. Table II. shows the changes in weight in young sheep on poor grazing, compared with those wintered on relatively good grazing.

TABLE II.

Group.	—	Body-weight in lbs.						
		Oct. 5th	Nov. 3rd	29th	Dec. 25th	Jan. 30th	Feb. 13th	Mar. 3rd
A.	Hill pasture	49	49	48	45	39	39	35
B.	Cultivated pasture ..	48	51	54	54	54	52	50

These figures refer to ewe hoggs. Group A were wintered at the experimental hill farm without supplementary feeding. Group B were wintered on arable ground at Aberdeen. Only pasture was fed.

As will be seen below, an interesting parallelism with these changes was observed in certain of the biochemical and serological properties of the blood.

Biochemical.—Chemical examination of the blood showed that in hill sheep on mineral deficient pasture the blood calcium reaches a maximum (11·8 mg.) in summer (July), shows a progressive fall throughout the winter months, to reach a minimum value of 8·2 mg. in the following spring (April).

The calcium content of the pasture showed a similar seasonal variation. The values found on analysis were 0·30 mg. calcium per cent. of dry matter in summer compared with 0·16 mg. in the winter months. This progressive fall in the level of the blood calcium accompanying a progressive reduction of body-weight in animals under ordinary farming conditions is a finding of both scientific interest and economic importance. Experiments at present in progress suggest that both under-nutrition due to lack of food, and malnutrition due to deficiencies of special dietary factors, are involved.

Workers in South Africa have found that in cattle grazing on phosphorus-deficient veldt the inorganic blood phosphorus may be less than 50 per cent. of the normal value. It is obvious that the calcium and inorganic phosphorus content of the blood is not so constant as has been supposed, but that it is directly affected by, and is to some extent a reflection of, the nature of the diet.

Serological.—In this study is was decided, as a first step, to carry out systematic observations on the natural immunity reactions of the blood-serum. The natural lytic, agglutinating, and complement-fixing antibodies of various animals for bacteria were made the subject of detailed inquiry in the Bacteriology

Department of Edinburgh University, and certain serum reactions dependent on these principles were selected in virtue of their known occurrence in measurable degree with sheep serum. The tests were strictly quantitative.

The reactions selected were as follows: (1) hæmolytic action of serum towards rabbit's erythrocytes, which depends on a natural lytic antibody acting along with serum-complement; (2) bacteriolytic effects of serum towards (*a*) *Bacillus coli* (a typical strain), (*b*) *Bacillus suipestifer*, which also depends on natural antibodies acting along with complement; (3) agglutinating effects of serum towards (*a*) *B. abortus* (Hg), (*b*) *B. paratyphosus* B, which are due to natural agglutinating antibodies acting independently of complement. Owing to an initial difficulty in obtaining a suitable hæmolytic system for testing sheep's complement independently of any natural hæmolytic antibody present in the serum, the preliminary observations do not include a direct measure of complement activity.

The serological tests on the hill sheep referred to above elicited most interesting results. In the month of May when, according to clinical observations, the state of nutrition was at its worst, and the calcium level of the blood at its lowest, all the serum reactions were markedly weaker than in sheep of the same breed, age, and sex grazing on a cultivated pasture at Aberdeen. Further, the seasonal changes (from May, 1930, to March, 1931) in certain serum reactions—e.g., hæmolysis—ran parallel to those in body-weight and blood-calcium, and in animals transferred in October from the hill farm to Aberdeen these reactions showed an augmentation in value corresponding to the increase in body-weight and blood-calcium. In view of our limited knowledge of the significance of these reactions, and also of the probable intercurrence of uncontrolled factors other than nutritional which affect them, these findings which are stated here in general terms must be interpreted with the greatest caution. The results indicate, however, that the natural immunity reactions of blood-serum may be markedly influenced by nutritional factors which also affect the chemical composition of the blood.

Hæmocytological—These tests showed great differences among individuals under similar dietary and other environmental conditions, and this must be allowed for in evaluating the data. The figures in Table III. show the averages of 40 sheep taken at random in spring when the condition of the animals was worst, and in summer when the condition was improved.

TABLE III.

—	Mean red cell content per mm.^{3} × 10^6	Mean white cell content per mm.^{3} × 10^3	Mean percentage of hæmoglobin.	Mean percentage volume of packed cells.
May, 1930	7·39±2·02	7·19	64±11·95	25·7±6·2
July ,,	10·23±1·96	8·47	92±11·81	30·8±6·3

So far as the results can be considered as significant, they show that anæmia is one of the features of the malnutrition noted in spring. The study of sheep throughout the year on grazings recognised to be of low nutritional value shows a parallel seasonal variation in the chemical composition of the pasture, the general clinical condition of the animals, and certain constituents and properties of their blood. As yet, however, the data are insufficient to allow definite conclusions to be drawn.

INFLUENCE OF DIFFERENT DIETARY FACTORS UNDER EXPERIMENTAL CONDITIONS.

The pasture on the experimental farm to which the above observations refer is relatively poor in protein and in inorganic constituents, especially calcium. An experiment was done on sheep kept in confinement to ascertain the influence of the addition of calcium, cod-liver oil, and protein, both singly and in combination, when added to a basal diet roughly corresponding to hill pasture in chemical composition.

Eighty castrated male sheep were used, which were about seven months old—i.e., about half grown—at the beginning of the experiment. They were taken from the Institute stock, and had a uniform pre-experimental nutritional history. They were divided into 16 groups of five each, eight groups being kept indoors and the other half in outdoor pens.

At intervals of about a month clinical notes were made; samples of blood were analysed for calcium, inorganic phosphorus, non-protein nitrogen, urea nitrogen, and at longer intervals for fibrinogen, albumin, globulin, cholesterol, and cystine. Serological tests and blood counts were also carried out as described above. The results briefly were as follows.

CLINICAL.

The animals in the indoor basal group after about four months stopped growing and became weak and emaciated. The addition of protein (in the form of cotton-seed meal) apparently led to a prolongation of the growth period, but later signs of bone deformity and debility appeared and growth stopped.

The addition to the basal diet of either calcium or cod-liver oil prevented these results. Growth was most rapid in the groups receiving cod-liver oil. No such clinical differences were obvious in the outdoor groups until a much later date, and even then they never became so pronounced as in the indoor sheep.

In July the animals in basal and basal-plus protein groups indoors were so debilitated that the experiment had to be terminated. These groups, together with all poorly conditioned sheep from other groups, were then transferred to good grazing. This was followed by a remarkably rapid improvement in their condition.

BIOCHEMICAL.

The only biochemical data considered here are those referring to the calcium and inorganic phosphorus of the blood.

The pre-experimental average figures were calcium 11·45 mg. and inorganic phosphorus 5·11 mg. Table IV. illustrates the marked extent to which blood-calcium and phosphorus may be influenced by dietary factors. The figures refer to the outdoor groups in March, when no clinical differences were as yet appreciable.

TABLE IV.—*Blood-calcium and Inorganic Phosphorus.*

mg. per 100 c.cm.

	Calcium.	Phosphorus
Basal	7·06	10·53
,, + protein	6·46	11·32
,, + calcium	9·90	6·84
,, + C.L.O.	10·06	7·99
,, + protein + calcium	8·80	7·83
,, + protein + C.L.O.	9·35	7·78
,, + calcium + C.L.O.	9·66	6·72
,, + protein + calcium + C.L.O.	9·54	6·93

The figures show that there was a marked fall in the calcium in the basal group, accompanied by a marked rise in inorganic phosphorus. The addition of either calcium or cod-liver oil tended to maintain the normal levels of calcium and phosphorus in the blood.

In the indoor groups the general trend of the figures was similar as regards calcium, but the reciprocal rise in phosphorus was not observed.

Table V. illustrates the regulatory effect of cod-liver oil or lime in maintaining normal blood-calcium and phosphorus levels in the outdoor groups.

TABLE V.

mg. per 100 c.cm. blood.

—	Calcium.		Inorganic phosphorus.	
	January.	March.	January.	March.
All animals from basal or basal + protein groups	10·4	6·7	5·5	10·9
Animals, from other groups receiving either calcium or C.L.O. or both	10·9	9·5	5·3	6·9

SEROLOGICAL.

In this preliminary communication only those data which seem of most interest need be referred to. Individual animals, as might be expected, showed quantitative variation in their reactions, and the values for the animals in each group were therefore averaged. The number of animals in a group was small, and any differences, unless pronounced, were not regarded as significant. It is noteworthy, nevertheless, that these averages in the pre-experimental stage were on the whole remarkably uniform.

During the course of the experiment significant variations in the average values for certain of the reactions were observed. These were related to: (1) the time of the year, (2) environment—according to whether the animals were kept indoors or outdoors, (3) the nutritional groups, (4) transfer to grass towards the end of the experiment.

Seasonal Variations.—To estimate this the average values of all the animals were taken. The bacteriolytic effect towards *B. coli* rose to a maximum in March, and fell progressively in May and September. A similar curve was noted in the hæmolytic reaction and in the agglutination of *B. abortus*. In the case of *B. paratyphosus* B agglutination the seasonal curve was different: rising to a maximum in January, and then falling progressively in March and May, but rising again to a second maximum in September. Such seasonal fluctuations are of great interest from a physiological standpoint, and require a good deal of detailed investigation before any interpretation can be placed on them. It is obvious that they introduce a factor which must be allowed for in any study of serum reactions in relation to nutrition. It should be noted also that these seasonal changes do not show any parallelism with the general condition of the animals or the results of chemical examination of the blood, though such seasonal parallelism was observed among animals on the hill pasture.

Environment.—A marked difference was elicited between the indoor and outdoor animals in their bacteriolytic reactions towards *B. coli*. In January the average for the indoor animals was about twice that of the outdoor groups; this difference became greatly accentuated in March. In May and September, the divergence was less. A somewhat similar, although less marked, difference in March was noted as regards the hæmolytic reaction. On the other hand, in the agglutination of *B. abortus* the outdoor animals showed a higher average value throughout.

Nutritional Groups.—In certain reactions distinct group differences were noticeable at particular periods; in other cases differences were insignificant.

Bacteriolytic Action towards *B. coli*. Groups 4 and 8—i.e., animals receiving added calcium and cod-liver oil in their rations—exhibited the highest averages in the early part of the year; after this there were no significant differences.

Hæmolysis. In January and March, Group 8 showed the highest values. Among the outdoor animals, in January the average values of the groups deficient in protein (1 to 4) were noticeably higher than those receiving protein in their rations (5 to 8). In March, however, the position was reversed: the values for Groups 6 to 8, and especially 8, had risen, whereas in Groups 1 to 4 there was a conspicuous fall.

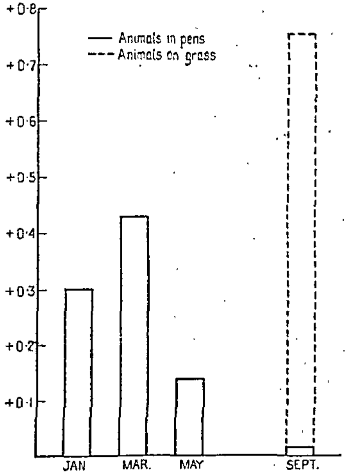

Chart showing comparative bacteriolytic activity of the blood-serum of sheep in pens and on grass.

Agglutination of *B. abortus*. The differences in September among the outdoor groups were striking, Group 1 (the animals in worst general condition) being highest, Group 8 (the best conditioned) lowest; Group 4 was the lowest of the protein-deficient animals (1 to 4), Group 1 the highest; Group 8 was the lowest of the animals receiving additional protein (5 to 8), Group 5 the highest. Taken together, the protein-deficient animals gave much higher average values than those receiving additional protein. This was practically the reverse of the hæmolytic results in March.

Transfer to Grass.—A comparison was made of the reactions in sheep transferred to grass towards the end of the experiment with those in animals kept in pens and rationed as previously. The average values for all animals in these two categories respectively were calculated, and remarkable differences were elicited.

Among the animals on grass a great increase was observed in the bacteriolytic activity towards *B. coli*, amounting to 29 times that of the animals on rations in pens (see Figure). An analogous result was obtained with another strain of *B. coli*. A similar difference, Department of Edinburgh University, and certain serum reactions dependent on these principles were selected in virtue of their known occurrence in measurable degree with sheep serum. The tests were strictly quantitative.

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The figures show that there was a *marked fall* in the calcium in the basal group, accompanied by a marked rise in inorganic phosphorus. The addition of either calcium or cod-liver oil tended *to maintain* the normal levels of calcium and phosphorus in the blood.

supplied at a nominal charge. The urine of each patient is tested before the course is commenced, and the temperature at each visit previous to undressing. Weights are recorded weekly.

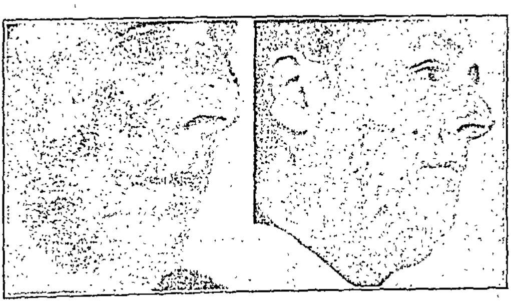
The treatment-room has through and wide ventilation, together with an electric fan, thus ensuring a constant circulation of air. Siemen's "snow-white" carbons have been used, as they were found to be cleaner and to give off less fumes than others tried. The initial dose, of 15 minutes back and front at three feet distance, is increased at weekly intervals by half an hour to a maximum of two and a half hours. This method is to be preferred to the shorter exposure of patients to more powerful cored carbons. The saving in time is counterbalanced by the risk of "lighting up" dormant lesions, and the very close medical supervision that is necessary. In attempting to combat a condition of extreme chronicity a rapid and transient stimulation appears unsuitable. Moreover, Leonard Hill and Eidinow[3] have shown, by exposing shaved rabbits to a "Beam" gas fire, which is rich in short infra-red rays, that their resistance to a general staphylococcal infection is increased. It would thus appear that the red and infra-red (heat) rays are of importance.

As the method of minimal stimuli gradually increased is perfectly safe, preliminary skin tests have not been found necessary. The majority of patients pigment well and profess a feeling of wellbeing. The carbon-arc lamps have been used for as many cases as possible, but general exposure to the Jesionek mercury-vapour lamp has sometimes been used. With this lamp, exposures at three feet distance are at first one minute back and front, increasing by two minutes weekly to a maximum exposure of 20 minutes. The results have not been found so satisfactory as with the carbon-arc lamps.

LUPUS.

As Reyn[4] has pointed out, lupus can be improved by light baths alone, but a real cure will not occur without the application of concentrated light. This has been obtained by the use of the water-cooled mercury-vapour (Kromayer) lamp with exposures long enough to obtain a blister (5–20 minutes), care being taken, by pressure of the lens, to render the part as bloodless as possible.

FIG. 1.



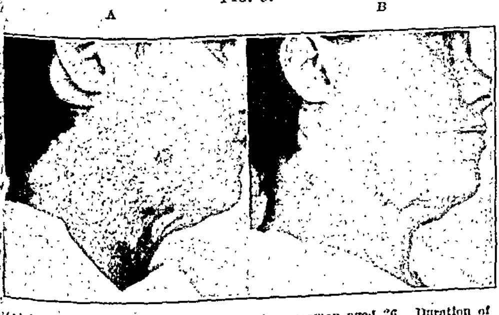
(A) Lupus of 33 years' duration in a woman aged 40. Previously treated with Finsen light at a skin hospital for five years and "snow." No treatment for last 19 years.
(B) Same patient after 14 months' treatment with general carbon-arc and local mercury-vapour Kromayer lamps. Pigmentation: deep. Weight: lost ½ lb.

In the treatment of extensive thick or warty lupus, especially on the trunk or limbs, a preliminary energetic treatment with creosote and salicylic acid plaster has proved very useful, as has "spiking" of isolated nodules with acid nitrate of mercury. A number of long-standing cases of widespread lupus have been treated at Eccles; many of them have had previous X ray treatment elsewhere. These cases have often proved intractable and tedious, with a tendency towards malignancy. They require more care and watchfulness than those not previously treated.

TUBERCULOUS ADENITIS.

Apart from lupus and scrofulous conditions of the skin, the next largest group treated has been tuberculous glands with softening, and frequently skin involvement. In these cases local treatment of the glandular condition is essential, by aspiration if possible, or by incision when the skin cannot be saved. The results in these cases have usually been good. More intractable is adenitis without softening. Local treatment with the Jesionek lamp in addition to general exposure to carbon-arc or mercury-vapour lamps has been found useful. It results in either (*a*) softening, when the local exposure should cease and aspiration be done; or (*b*) hardening and shrinking of the glands. The end-result is frequently the presence of small hard glands, which are apparently quiescent.

FIG. 3.



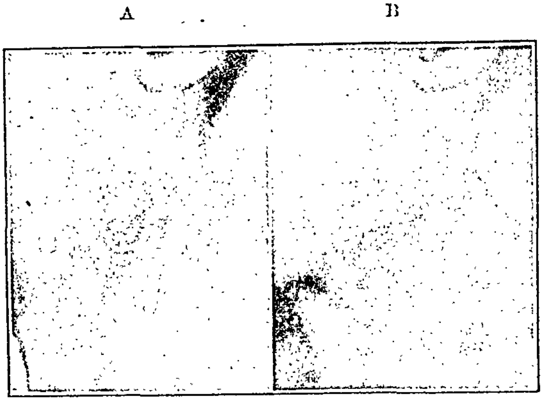
(A) Enlarged glands and scrofuloderma in a woman aged 26. Duration of disease before light treatment commenced, 19 years. Previous treatment: several operations.
(B) Condition after five months' treatment with carbon-arc and Jesionek (General) lamps. Pigmentation: deep. Weight: gained 10½ lb.

OTHER TUBERCULOUS CONDITIONS.

Other conditions—e.g., tuberculosis of bones, joints, and abdomen—will be referred to later. No cases of pulmonary tuberculosis have been treated.

It must be emphasised that light treatment has been used as a caustic or a stimulus, and has been combined with other forms of treatment—e.g., local caustics, aspiration and incision of superficial abscesses, and division of keloid bands. Attention to the general hygiene of the patient must not be overlooked; in some cases of under-nourishment milk has been provided with apparent benefit.

FIG. 4.



(A) Cervical adenitis with sinus in a boy aged 9. Duration of disease before light treatment commenced: four years. Previous treatment: operations.
(B) Condition after three months' treatment with carbon-arc and Jesionek (local) lamps. Pigmentation: medium. Weight: gained 3 lb.

Results.

The present paper deals with the three years 1928–30, during which period 273 cases have been treated (Table I.).

TABLE I.

—	Adults.	Children.	Total.
Lupus and scrofulous skin conditions..	75	31	106
Adenitis with softening ..	45	48	93
Adenitis without softening ..	15	21	36
Bones and joints	21	3	24
Abdomen	3	5	8
Others	4	2	6
Total	163	110	273

Of this number 63 ceased treatment for one or other of the following reasons: (*a*) admitted to a residential institution, (*b*) removal from district, (*c*) unwilling or unable to continue treatment on account of work or domestic circumstances. The 63 consisted of 45 adults and 18 children, and be subdivided as follows: lupus, 21; adenitis softening, 19; adenitis without softening, 11; bones and joints, 8; abdomen, 1; others, 3. At the end of 1930, 152 patients had been discharged as quiescent, leaving 53 still under treatment. Particulars of the patients discharged, together with the average duration of treatment, are shown in Table II. The average duration of all the 152 cases was seven and three-quarter months. The results are adversely affected by the existence of many cases of extensive lupus of long standing. Thus, four adult lupus cases have attended for over two years, and one of them has only made 70 attendances.

TABLE II.

Av. = Average duration of treatment in months.
A. = Adults. C. = Children.

—		Quiescent.		Improved.		Stationary.	
		No.	Av.	No.	Av.	No.	Av.
Lupus and scrofuloderma	A.	35	12	3	10	—	—
	C.	21	7½	—	—	—	—
Adenitis with softening	A.	29	6½	—	—	—	—
	C.	35	6	—	—	—	—
Adenitis without softening ..	A.	4	8	—	—	—	—
	C.	11	6¼	—	—	—	—
Bones and joints ..	A.	8	6½	—	—	2	8
	C.	1	8½	—	—	—	—
Abdomen	A.	3	4½	—	—	—	—
	C.	3	6	—	—	—	—
Others	A.	2	5¾	—	—	—	—
	C.	—	—	—	—	—	—
Totals	A.	81	—	3	—	2	—
	C.	71	—	—	—	—	—
		152		3		2	

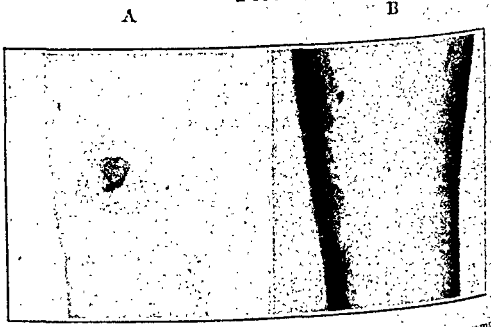
TABLE III.—*Pigmentation.*

—		Deep.	Medium.	Slight.	None.
Lupus and scrofuloderma	A.	23	9	—	1
	C.	14	4	1	2
Adenitis with softening ..	A.	19	9	1	—
	C.	19	15	1	—
Adenitis without softening	A.	2	2	—	—
	C.	5	5	1	—
Bones and joints ..	A.	5	2	1	—
	C.	—	1	—	—
Abdomen	A.	1	2	—	—
	C.	1	1	1	—
Others	A.	1	1	—	—
	C.	—	—	—	—
Totals		90	51	6	5

TABLE IV.—*Weights.*

—		Gained.	Lost.	No change.
Lupus and scrofuloderma ..	A.	20	14	1
	C.	20	1	—
Adenitis with softening ..	A.	19	9	1
	C.	31	2	2
Adenitis without softening..	A.	2	2	—
	C.	9	—	2
Bones and joints	A.	6	2	—
	C.	1	—	—
Abdomen	A.	1	1	—
	C.	2	1	1
Others	A.	1	1	—
	C.	—	—	—
Totals		112	33	7

FIG. 5.



(A) Bazin's disease, of three to four years' duration, in a woman aged 21. Previous treatment: attended a skin hospital for ointment and medicine.
(B) Condition after four months' treatment with carbon-arc and eusol dressing. Pigmentation: deep. Weight: gained 4½ lb.

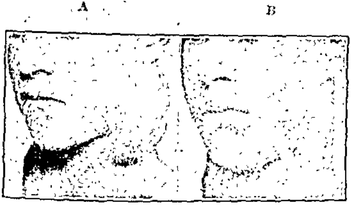
Table III. shows the degree of pigmentation of the 152 cases discharged as quiescent.

Thus in 90 the pigmentation was deep and in 51 medium, and improvement appears to be definitely associated with a good degree of pigmentation. As the ultra-violet rays cannot penetrate pigmented skin, early deep pigmentation is undesirable. With very deep pigmentation the carbon-arc baths have sometimes been temporarily suspended or replaced by exposure to the Jesionek lamp, local treatment being continued. The five cases without pigmentation received local treatment only.

WEIGHT OF QUIESCENT CASES.

Of 152 quiescent cases, 112 gained weight, 33 lost weight, and in 7 no change occurred (Table IV.).

FIG. 6.



A) Adenitis in a boy aged 16. Disease began ten years previously. *Previous treatment*: two operations at a general hospital eight years ago.
B) Condition after four months' treatment with general carbon-arc and local mercury-vapour Jesionek lamps. Also aspiration. Pigmentation: deep. Weight: gained 14½ lb.

The appearance of typical cases before and after reatment is shown in the accompanying plates, and ssential particulars are given in the corresponding egends.

RELAPSES.

All patients since discharge have been inspected at egular intervals; 23 patients have shown some egree of relapse, and further treatment has been iven. These cases were as follows: lupus, 16; denitis with skin involvement, 4; adenitis without kin involvement, 3.

Finance.

Lissant Cox[5] has dealt fully with the financial spect of light treatment at dispensaries, and has hown that a considerable saving has been effected s a result of not sending patients to residential nstitutions and out-patient departments of hospitals. he cost, which includes carbons and current as well s all standing charges—e.g., proportion of time of edical and nursing staff, rent and rates, fuel, light, leaning, repairs, renewals, and depreciation—naturlly varies with the number of patients treated. At ccles the numbers under treatment at the end of 928, 1929, and 1930 were 73, 60, and 53 respectively. n 1929 the total cost per patient per week was 4*s*. 6*d*., hich is about the same as the average for the dministrative county of Lancaster (403 patients nder treatment at 12 centres at the end of 1929).

Conclusions.

1. Artificial light treatment can be successfully ven at tuberculosis dispensaries under the control f local authorities.

2. It is especially useful in cases of lupus and allied kin conditions, adenitis with and without softening, nd other superficial conditions.

3. It is much less effective in the treatment of berculous disease of the larger joints and bones, hich should be sent to special residential institutions.

4. In the treatment of lupus a combination of eneral light therapy with local treatment—e.g., Kromayer lamp—is usually necessary, and the carbon-arc bath is to be preferred to the mercury-vapour lamp for general irradiation.

5. Prolonged exposure to weak carbons is preferable to brief exposure to strong-cored carbons. It is efficacious, safe, and particularly suitable for use by tuberculosis officers who have other duties to perform outside their dispensaries.

6. To obtain the best results, actinotherapy needs frequently to be combined with various forms of local treatment—e.g., the use of suitable caustics in lupus, and the aspiration or incision of abscesses. Painstaking attention to detail on the part of the doctor and nurse, and the regular attendance of the patient, are essential for success.

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PORENCEPHALY.

A BRIEF REVIEW, WITH DESCRIPTION OF A CASE.

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TRUE porencephaly is a rare condition and will always be of interest, partly owing to the striking disproportion between the great anatomical defect in the brain and the mild degree of physical symptoms, partly on account of the controversy over its ætiology.

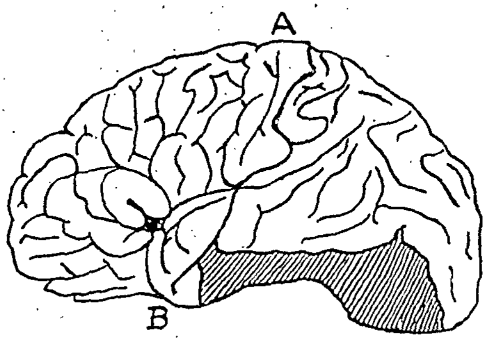
Heschl, who in 1859 first described this condition under its present name, assumed that the loss of brain substance was due to faulty development, analogous to other congenital malformations. Later he changed his view in favour of circulatory disturbances. Kundrat, in 1882, studied 12 cases and came to the conclusion that most of the porencephalic defects were congenital and due to vascular disturbances, hydrocephalus, anæmia, or psychic disturbance in the mother during pregnancy. He extended the use of the term to include any cerebral defect roofed over by the arachnoid. Schultze was the first to suggest that porencephaly might be due to infectious encephalitis and based his view on microscopic evidence of inflammatory changes. The existence of prenatal encephalitis was proved possible by Virchow and this ætiological theory has been supported by Strümpell, Limbeck, and recently by Globus. The histological investigations of the latter in a typical case afforded evidence of a meningo-encephalitis which led to strangulation of the blood-vessels producing anæmic necrosis, glial proliferation, and finally sclerosis and cavity formation. Very recently, Jaffé has emphasised the importance of trauma, which may occur in utero, during birth, in infancy, or in later life. He holds trauma at birth to be the commonest cause, citing the frequency of prematurity, prolonged labour, and instrumental delivery in the history of these cases, and suggests that, in addition to the direct action of the trauma on the brain, circulatory disturbances in the large veins from a damming-back of the blood in the sinuses are of great importance. In refuting the inflammatory theory he argues that inflammation may well be superimposed on a brain with an existing porencephalic defect, the latter acting as a locus minoris resistentiæ.

The following is an illustrative case of the traumatic group.

A female, aged 32, was admitted to Derby Mental Hospital in March, 1929, as a case of imbecility with epilepsy.

History.—Since infancy she had suffered from occasional epileptiform convulsions. In August, 1927, she had a serious fit and was comatose for two days. Her fits were not frequent, numbering about three or four a year. She had always had slight difficulty in walking, and had also suffered from a squint since infancy. Mental backwardness showed itself early, and at the age of 14 she had only reached Standard IV. She had never been able to earn her own living and was subject to frequent attacks of headache.

Her birth was abnormal. A fortnight before term her mother had a bad fall which brought about a premature labour; this was prolonged, but not instrumental. The patient was the twelfth child. No obvious abnormality was discovered after the birth. The fits began about a year later.



On admission she was an under-developed, but well-nourished female. No stigmata of degeneration were present, but there was a mild degree of right-sided pes cavus. In the heart, lungs, and alimentary system no abnormality was detected. The urine contained no albumin or sugar. The Kahn reaction of the blood was negative.

The pupils were equal and regular in outline and reacted to light and accommodation. There was right external strabismus. Marked nystagmus was present, most noticeable when the patient looked to the left. The sight of the right eye was greatly impaired, though probably the condition was a right-sided homonymous hemianopia as, owing to her mental state, very little coöperation could be obtained from her. The tendon reflexes were abnormally brisk in the right lower limb, which was slightly spastic and showed a certain loss of coördination. The right upper limb was normal in all respects except for a rather weakened grip. A Babinski sign was obtainable on the right side at times. No anæsthesia could be detected.

The patient was hesitating and slurring in speech, dull and retarded in thought, and had little educated intelligence. Her memory was impaired and she was unable to do the simplest calculations. She could give no connected account of herself and was childish in her ways.

During her stay in hospital she had only one fit, which was of an epileptiform nature. She was able to get about the ward and did some useful light work. In December, 1929, she developed pulmonary tuberculosis, and she died in June, 1930.

Autopsy findings.—The calvarium showed increased thickness in its left posterior quadrant. The meninges and vessels appeared normal. The brain weighed 32¼ oz. The right hemisphere appeared normal and weighed 16 oz. The left hemisphere was the seat of a large porencephalic cyst in its posterior half and weighed only 10 oz.

In the diagram the porencephalic area is represented as situated to the right of the line A–B, and the shaded area represents the porus covered with membrane.

The cavity was found to be in direct continuity with the lateral ventricle and to contain cerebro-spinal fluid. It measured 8½ cm. × 6½ cm. × 3½ cm. and extended from the occipital pole almost to the apex of the temporal lobe, undermining the central white matter beneath the Rolandic area. The lining of the cavity was smooth. The unaffected cortex at the edges gradually thinned out to form the cyst wall. This thinned cortex had lost its normal configuration, and no definite gyri or sulci could be identified. It had a uniform thickness of 2–3 mm. except on the medial surface, where it measured 11–12 mm. with the configuration retained. Inferiorly the thinned cortex merged into the membrane roofing over the gap. This membrane consisted of two layers, the outer layer being continuous with the pia-arachnoid, the inner with the lining of the cyst and the lateral ventricle. A curious feature presented itself; an offshoot of the choroid plexus was attached to the inner surface of the membrane and formed a conspicuous band of choroid tissue stretching across the cavity.

On section the corpus callosum was found to be greatly thinned, especially in its posterior half. The internal capsule, too, was much wasted, though the basal ganglia appeared normal, and in the medulla a marked diminution in the size of the pyramid was evident on the left side.

Microscopic section of the pre- and post-central gyri showed paucity in the number of pyramidal cells and disturbance of lamination, with exaggerated gliosis, especially towards the surface. No trace of any inflammatory exudate or perivascular round-celled infiltration could be seen. The thinned cortical cyst wall consisted of a dense network of neuroglia and degenerated nerve fibres with total absence of nerve cells. The membrane consisted of an outer layer of pia-arachnoid carrying blood-vessels and an inner composed of flat or low cubical epithelium, identical in structure with ependyma; interposed between the two were strands of neuroglia fibres.

Porencephaly may be suspected, but cannot often be diagnosed during life for, as Tredgold says, the hemiplegia in some cases of pronounced porencephaly discovered post mortem is often astonishingly insignificant. This can only be explained by the faculty of the contra-lateral hemisphere to undergo relative compensatory hypertrophy and thus to assume functions of the atrophied half. Diagnostically, besides the history, the only suggestive features are the occurrence in a mental defective of epileptiform convulsions, headache, hemiplegia, and a flattening of one side of the skull. The latter sign, however, is frequently absent, as in the case related above. Here the history of a difficult premature labour following an injury to the mother again illustrates the importance of trauma at birth in the ætiology of this rare condition.

I am indebted to Dr. J. Bain, medical superintendent, for permission to publish this case.

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PROLONGED ADMINISTRATION OF ARTIFICIAL RESPIRATION.

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IN a series of papers published elsewhere there have been presented physiological[1] and clinical[2] data obtained by the use of a mechanically operated device for administering artificial respiration over long periods.

The device used is known as a respirator and consists of a sheet metal tank equipped with a comfortable bed and mattress (Fig. 1). The patient's head protrudes through a flat soft rubber diaphragm or collar attached to the body of the respirator, the rubber collar making an air-tight seal about the patient's neck. The diameter of the collar is adjustable, and thus excessive tension on the neck of the patient is avoided.

By means of electrically driven blowers and an appropriate valve arrangement, the air pressure within the tank is changed alternately from a few centimetre of water negative pressure to normal atmospheric pressure. The negative pressure induces inspiration—the chest and diaphragm of the patient expand and air is inhaled. The return to atmospheric pressure allows the recoil of the thorax and the respiratory muscles, together with the elasticity of the lungs, to cause expiration. Both the depth and the rate of breathing are under the control of the attendant and can be measured (or recorded) by means of a suitable U-tube manometer, filled with coloured water and connected by rubber tubing to the body of the respirator.

In general, a negative pressure of about 12 to 18 cm. of water suffices to maintain adequate ventilation in an adult or child with complete respiratory paralysis. In the case of new-born babies in which respiration does not begin within a few minutes after birth, smaller negative pressures (from 8 to 10 cm.) have been found adequate.[3] Our experience indicates that the negative pressure used should just be sufficient to prevent cyanosis or obvious respiratory distress; nothing is gained by using excessive negative pressures for long periods, while we have reason to believe that such pressures actually do harm to the lung tissue, particularly in the case of infants whose lungs may be atelectatic.[4]

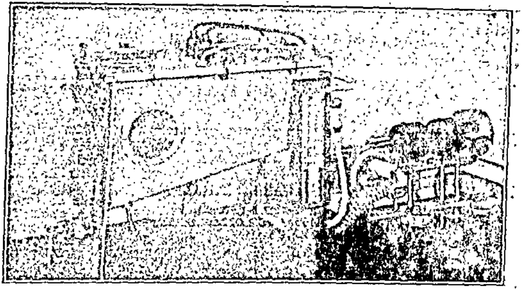
Without having the pump stopped, the patients can eat, drink, and sleep while in the respirator. A bed-pan can be passed through one of the portholes, enemas can be given, and rectal drips can be administered in deglutition cases. The noise of the machinery, although not excessive, is sufficient to prevent the use of a stethoscope in chest and heart examinations. We have taken rontgenograms of patients' chests both while the respirator was running and when the bed was pulled out and the pump stopped.

FIG. 1.

Respirator (for adults) showing patient in the apparatus. (Photographs by courtesy of Messrs. Siebe, Gorman and Co.)

Of possible interest to physiologists is the fact that such slight negative pressures—equivalent to 12 to 18 cm. of water—are sufficient to induce inspiration in a person whose respiration has ceased, and that it has been found unnecessary to use positive pressures inside the respirator. In the case of an animal deeply anæsthetised or curarised still smaller negative pressures suffice. The method offers the advantage, over intratracheal insufflation, that it imitates normal breathing fairly accurately.

FIG. 2.



Respirator for infants. The chamber is heated, when necessary, by two electric bulbs on the inside.

Severe apnœa can be produced on normal humans by intentional over-ventilation of the subject. In clinical practice the severely paralysed patient may be over-ventilated by increasing the depth of the respirations just prior to being withdrawn from the apparatus for a few minutes, in order that he may be bathed and changed. Without such over-ventilation he may become cyanotic too quickly to permit reasonable nursing care or medication.

This apparatus has had two years' trial in the United States and Canada and has been used in some 100 cases of respiratory failure from acute poliomyelitis, over 50 cases of unusually severe carbon monoxide poisoning, about 10 cases of alcoholic coma, 7 of drowning, 1 of post-diphtheritic paralysis, and over 30 of asphyxia of the new-born. In general the intercostal paralysis of poliomyelitis can be treated with immediate relief and comfort to the patient, the length of treatment varying from a few hours to several months, according to the severity of the disease. Cases of gas-poisoning, alcoholic coma, and drug poisoning seldom require more than 24 hours' treatment, while new-born babies rarely require over one to two hours' continuous treatment.

With the exception of those with poliomyelitis the patients usually recover completely. Numerous cases of both children and adults with severe intercostal paralysis from poliomyelitis have made gratifying recoveries, although we have several who have recovered the use of their intercostals but are otherwise crippled.

In view of the fact that over 70 of the adult machines and 12 of the infant size (Fig. 2) are in successful use in America, the manufacturing details have been entrusted to Messrs. Siebe, Gorman and Co., of London, and the apparatus will be made here as desired by the medical profession. No profits will accrue to any person in any way concerned with the development or sale of the apparatus in America.

This apparatus was developed and subsequently made available through the generosity of the Consolidated Gas Co., of New York City, who gave the funds to the Harvard School of Public Health to cover the expenses of the original research, and later bought and presented 14 adult-sized respirators to various hospitals in New York City.

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CLINICAL AND LABORATORY NOTES

A CASE OF APLASTIC ANÆMIA.

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AND

A. Turner, M.D. Durh.

A MAN, aged 52, complained of acute pain in the epigastrium, mainly dependent upon the taking of food and frequently appearing during the night. It had first been noticed some six months previously. Pallor and dyspnœa appeared three months later. There was nothing noteworthy in his previous medical history and no history of venereal disease. He had noticed a tendency to "bleed" from small wounds, and four years before had had an attack of epistaxis, for which his nostrils had been plugged. He thought that his family, especially on the male side, was more than usually liable to bleed.

He was very abstemious and smoked little. His normal weight was 14 st. 7 lb.; when first seen it was 14 st. His appetite was good, but he suffered from considerable pain and discomfort after meals, with occasional pyrosis. The bowels were regular, and no blood had been noticed in the motions. Vomiting had not occurred. The urine contained a trace of albumin but nothing otherwise noteworthy. On physical examination he was remarkably anæmic but without a lemon tint. A few purpuric spots were noticed on the mucous surfaces of the lips, but not elsewhere. The pulse-rate was 92 and the pulse was regular and of medium force; the radial wall was healthy. The systolic blood pressure was 146 and the diastolic 66 mm. Hg. There was nothing discoverable in the viscera of the chest or abdomen except such as might be directly associated with the anæmia. The teeth were poor and the tongue slightly furred. There was no œdema, no history of sweating, and no evidence suggesting associated disease of the central nervous system. The diagnosis appeared to lie between duodenal ulcer, gastric neoplasm, and pernicious anæmia.

An X ray examination after an opaque meal was made by Dr. Stanley Melville and the conclusion reached that, although the behaviour of the stomach was not typical of duodenal irritation, a definite residue at two and six hours made it impossible to exclude ulceration in this region. The result was thus inconclusive as regards the presence of ulceration but appeared to negative malignant disease. Examination of the stools for occult blood showed that this was present in moderate amount. The blood count made at the time was as follows: white blood corpuscles, 3200 per c.mm.; red blood corpuscles, 2,500,000 per c.mm.; hæmoglobin, 22 per cent.; colour-index, 0·44; polymorphonuclear leucocytes, 63·0 per cent.; eosinophils, 1·5 per cent.; basophils, 0·5 per cent. large hyalines, 6·0 per cent.; small lymphocytes, 29·0 per cent.; poikilocytosis, anisocytosis, and polychromatophilia were present, but no nucleated red cells were seen. The coagulation time was not altered. The result of the blood examination was thus not specially indicative of pernicious anæmia, but rather suggested an anæmia secondary to hæmorrhage from duodenal ulceration. The patient was accordingly put to bed and treated upon this supposition. No improvement was obtained; the occult blood persisted in spite of all forms of treatment, including injections of horse serum, and no marked change was noticed in the general condition.

A consultation was held with Mr. G. Gordon Taylor and, while the difficulties of the case were fully appreciated, it was felt that, with the history of gastric symptoms already detailed, the persistence of occult blood in the stools and the absence of any other form of bleeding, together with the obviously serious condition of the patient, it would be advisable to open the abdomen and search for ulceration. This was accordingly done, but nothing was found to throw light upon the symptoms. The patient made a successful recovery from the operation, no special tendency to bleed having been noted, and his general condition remained in statu quo. The teeth meanwhile had received attention. A course of treatment by liver was tried and he was subsequently transfused, but without success.

Blood examinations were made from time to time and, while some of the counts had features suggestive of pernicious anæmia, none was typical, and nucleated red cells were never found. It now became apparent that the case was a true blood disease to which the anæmia and hæmorrhages were secondary, and the diagnosis of aplastic anæmia was made. The patient returned home and died about nine months after our first consultation, all forms of treatment having proved unavailing. The final count made three months before his death was as follows: white blood corpuscles, 6200 per c.mm. red blood corpuscles, 1,750,000 per c.mm.; hæmoglobin, 25 per cent.; colour-index, 0·7; polymorphonuclears, 62·5 per cent.; eosinophils, 0 per cent.; lymphocytes, 30·5 per cent.; mononuclears, 6 per cent. The stained film showed marked poikilocytosis and anisocytosis was very evident; there was a considerable number of megalocytes. A few cells showed polychromasia, but there were no nucleated forms. The report added the suggestion that despite the low colour-index, this count had several of the features of a true pernicious anæmia.

POST-MORTEM EXAMINATION.

The body was that of a well-nourished middle-aged man with pronounced pallor of the skin. Post-mortem staining was absent. There was a comparatively thick layer of yellow subcutaneous fat and the pericardial fat was increased. There was extensive and advanced fatty degeneration of the myocardium with fatty striation of the musculature of the walls of both ventricles as well as of the papillary muscles. There was an excessive deposit of fat in the omentum and mesentery, but no enlargement of the mesenteric glands. The intestines were normal; ulceration and neoplasm were both absent. The liver was enlarged and very soft, rusty brown in colour with deeper coloured areas suggestive of chronic passive congestion. The macroscopic appearances were consistent with widespread fatty change and some atrophy. The ferrocyanide reaction was only very slight. The spleen was a little enlarged, its pulp soft, and the normal markings lost. The cut surface presented a uniform appearance which might have been due to post-mortem changes. The kidneys were pale and apparently fatty, but showed nothing otherwise noteworthy. No special changes were observed in the pancreas and suprarenals. The bone-marrow of the femur was very pale and appeared to be mostly fatty, with the exception of a pinkish streak about 5 mm. in diameter. It was evident that erythrogenetic activity was inconsiderable.

HISTOLOGICAL REPORT.

Liver.—No changes of special importance beyond passive congestion and areas of central atrophy and fatty degeneration.

Lungs.—Œdematous.

Spleen.—The most striking feature was the comparative absence of red corpuscles. The Malpighian corpuscles were very poorly represented and appeared to be inactive. The reticulum cells were also apparently diminished in number and the connective tissue reticulum of the organ was very evident, although no new formation of fibrous tissue had occurred. A very fine fatty infiltration of the reticulum was present. The ferrocyanide reaction was negative.

Kidneys.—Chronic interstitial nephritis was present, with a considerable amount of fat in the epithelial cells.

Heart.—There was well-marked fatty degeneration.

Pancreas.—No special change.

Bone-marrow.—The section was taken through the reddish streak previously mentioned as being the most likely area to show evidence of the presence of regeneration. Many cells were found with basophil cytoplasm containing larger or smaller masses of hæmoglobin. In some cells there were definitely one or more mature red blood corpuscles, which suggested that some erythrocyte destruction was in progress. No typical nucleated red blood corpuscles could be found. Of the white cells the most prominent were eosinophil granular leucocytes of the myelocyte type, but typical polymorphonuclear leucocytes were not common. Cells of the lymphocyte series were fairly numerous.

We are indebted to Dr. H. W. Vines, of the Charing Cross Hospital Institute of Pathology, for the post-mortem report.

Thus, while the gross changes in the viscera were similar to those in pernicious anæmia of the ordinary type, there were also important differences in that the bone-marrow showed an absence of new red cell formation and nucleated red cells were entirely absent. The ferrocyanide reaction in the liver and spleen was also absent or inconsiderable.

Apart from the extreme pallor and the gastro-intestinal symptoms, the latter of which ultimately yielded to treatment, the most noteworthy clinical features were the presence of occult blood in the stools which proved quite uncontrollable, resisting all forms of treatment, and a blood count resembling in some respects pernicious anæmia yet seriously differing from it and at first suggesting a secondary anæmia for which the persistent intestinal bleeding offered a primary cause. A further complicating factor was the suggested history of "bleeding" in the family confidently put forward by the patient. This led to an examination of his blood coagulation time, which nevertheless was found to be unaltered. It is unfortunate that the platelets were not specially noted in the blood examination.

There had been no free hæmorrhage either from the stomach or bowel, but a persistent oozing arising from the gastro-intestinal mucosa. The absence of nucleated red cells from the blood counts did not perhaps receive sufficient weight in the earlier stages of the patient's illness, but the serious general condition, the history of gastric pain and pyrosis, and the persistent loss of blood seemed to suggest the possibility of a gross gastro-intestinal lesion which it was advisable to deal with or exclude. It was accordingly dealt with, but not without much misgiving.

DIFFERENTIAL DIAGNOSIS.

The case had all the appearances of an anæmia dependent upon persistent loss of blood, the main feature being a progressive fall in the number of red cells, accompanied in a general way by comparable changes in those characters usually associated with severe anæmia. A small apparent rise in polymorphonuclear cells may have been due to some septic complication; on the other hand, there was a small excess of lymphocytes. Thus intestinal hæmorrhage for which no gross lesion could be found, associated with a grave and uncontrollable anæmia, was the main clinical characteristic.

Post mortem the main change was found in the bone-marrow, which had the appearances consistent with failure of its normal erythrogenetic activities. Evidence of abnormal blood destruction in the liver and spleen was not found, as shown by the absence of the ferrocyanide reaction.

The clinical diagnosis between aplastic and pernicious anæmia depends upon a progressive fall in the red cell count and in the absence of any appearance of blood regeneration, together with complete resistance to all forms of treatment. It is of interest to note that even in an anæmia of such severity normal recovery from operative interference occurs. It was suggested in one of the blood counts already detailed that some of the characteristics of pernicious anæmia were present, and it may be a matter of some difficulty to decide between these two conditions upon blood examination alone. That there should be a certain amount of overlapping between aplastic and pernicious anæmia might perhaps be expected, for it is highly improbable that the erythrogenetic properties in the marrow of all the bones should be equally affected or should entirely fail, for the end would come when blood regeneration fell short of bodily requirements—when the balance between red cell production and destruction was so far disturbed as to be incompatible with life. Meanwhile, it is conceivable that the cells formed by the failing bone-marrow would be less resistant than normal to ordinary destructive influences and that a certain clinical resemblance to pernicious anæmia might be produced in this way.

Aplastic and pernicious anæmia appear to be blood diseases probably unconnected with each other except in so far as they occur at different phases in the life-history of the red cell. The former is a failure of red cell production; the latter an excess of red cell destruction.

Glossitis, achlorhydria, and degenerative changes in the central nervous system are absent. The colour-index of the blood and the hæmoglobin content of the red cells are variable and may be unreliable for differential diagnosis, which must be based upon the presence of a wholly intractable anæmia, with or without hæmorrhage from the mucosæ, along with a blood picture characterised by great reduction in the number of red cells and an entire absence of the features commonly associated with red cell formation. The duration of the disease varies through narrow limits and is almost invariably fatal.

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A CASE OF MENINGITIS CAUSED BY STAPHYLOCOCCUS AUREUS.

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MENINGITIS caused by the *Staphylococcus aureus* is rare enough to make the following case worthy of note.

The patient was a female, aged 11 years, and was admitted to the North-Western Hospital on Feb. 18th, 1931, certified as suffering from cerebro-spinal meningitis, with a history of headache, vomiting, and constipation dating from Feb. 12th; there was also a history of intermittent vaginal discharge during the preceding 18 months. Retraction of the head was noticed on Feb. 17th.

On admission the temperature was 101·6° F., the pulse-rate 112, and the respiration-rate 22. There was marked head retraction and arching of the back, with increased knee-jerks and a marked Kernig's sign. The pupils were equal and reacted normally, and the mental condition was perfectly rational. Vomiting occurred twice on the day after admission but was not a marked feature, being absent until March 4th, when it became very persistent and remained so until the end. Headache was only slight, but head retraction and arching of the back steadily increased until finally both were present in an extreme degree. The patient slept well and remained moderately quiet until Feb. 24th, when a generalised serum urticaria, accompanied by great restlessness and shouting, supervened. A brownish vaginal discharge was noted on this date. On the following day she was more drowsy, and speech became slow and slurring. Dysphagia appeared on Feb. 27th, increasing in severity until, on March 1st, nasal feeding became necessary. Shouting and restlessness reappeared on Feb. 27th and continued until exhaustion supervened. Death took place on March 6th. Pyrexia was not marked, the temperature never exceeding 102° F. until immediately preceding death. For the first week it fluctuated between 99° and 102° F., then remained roughly normal for three days, when it again rose and remained elevated until death occurred.

TREATMENT.

Lumbar puncture was performed on admission, under general anæsthesia, when 30 c.cm. of turbid fluid escaped under increased pressure and, in view of the appearance of the fluid and the certified disease, 15 c.cm. of Lister's antimeningococcal concentrated serum was given intrathecally. This procedure was repeated on Feb. 19th, 20th, 21st, 23rd, and 25th, when turbid fluid varying from 36 c.cm. on the 19th to 15 c.cm. on the 25th escaped. On the latter date the fluid was thick and purulent, and there was no increase of pressure. At this point it was thought probable that a blockage had occurred in the spinal canal which was preventing proper drainage by lumbar puncture; accordingly, on Feb. 26th, a puncture of the cisterna magna was performed, 32 c.cm. of turbid fluid escaping under pressure and 10 c.cm of Lister's serum being injected; lumbar puncture on the same occasion yielded only 3 c.cm. of purulent fluid. Cisternal and lumbar puncture were repeated on Feb. 27th and 28th, March 2nd and 3rd, but as bacteriological reports had all been negative as regards the meningococcus the administration of serum was discontinued. On March 3rd an attempt was made to wash out the spinal canal with distilled water through the needle in the cisterna magna to the lumbar puncture needle which had been left in situ. The procedure was unsuccessful, no fluid escaping from the lumbar puncture; the fluid was therefore allowed to escape again from the cisternal puncture needle.

The only drug treatment was the administration of a sedative mixture and of a single dose of morphia on the day preceding death.

PATHOLOGICAL INVESTIGATIONS.

These were mostly carried out at the Council's laboratory at the North-Eastern Hospital, where seven specimens of cerebro-spinal fluid were examined and reported upon. Four had been obtained by lumbar puncture and three by cisternal puncture. A pure culture of *Staphylococcus aureus* was obtained in all but the first lumbar puncture specimen, from which a few colonies of a Gram-negative diplococcus were grown. This organism, however, proved not to be the meningococcus.

Cell counts showed a marked polymorphonuclear leucocytosis ranging from 10,000 per c.mm. in the first lumbar puncture specimen to 300 per c.mm. in the cisternal puncture specimen obtained on March 2nd. Reducing sugar was absent in all the lumbar puncture specimens and present in moderate amount in all cisternal specimens.

When it was definitely established that the *Staphylococcus aureus* was the infecting organism, search was made for a septic focus. Examination of a smear and culture from the cervix uteri showed only a Gram-negative coliform bacillus. Examination of the ears was negative but a blood culture made on Feb. 27th gave a pure culture of *Staphylococcus aureus*; there were about 50 colonies per c.cm. of blood.

AUTOPSY.

A post-mortem examination was carried out on March 7th.

Head.—The meninges and brain appeared normal except for some engorgement of the occipital region, probably due to hypostasis. Both middle and internal ears were opened and the left middle ear was found to contain thick yellow pus. A culture tube was inoculated from this pus and a pure culture of *S. aureus* obtained.

Spinal Canal.—On exposing the spinal canal the theca appeared normal externally but on incision the spinal cord was found to be surrounded with thick yellow pus. This was most profuse in the lumbar region and extended, though in diminishing amount, as far upwards as the upper dorsal region. Sections were made of the cervical, dorsal, and lumbar regions. The cervical region showed congestion of the blood-vessels and a definite, though not marked meningitis. The large motor cells showed marked degenerative changes—i.e., disappearance of granules and breaking up of nuclei. The dorsal region showed similar congestion and degenerative changes in the larger nerve-cells. In the lumbar region the meninges showed much more definite meningitis with abundant polymorphonuclear cells and fibrin on the meninges and around the nerve roots. Masses of staphylococci were present. The larger nerve-cells showed the degenerative changes described above.

Thorax.—The pleura, pericardium, and heart were normal. In the lower part of the upper lobe of the left lung about half a dozen small nodules were found; on section these showed changes varying from acute œdema through broncho-pneumonia to definite abscess formation.

Abdomen.—Nothing abnormal was found in the abdomen except that the liver was dark on section and engorged with blood; the Fallopian tubes were a little congested; the cervix uteri was a little patulous and the endometrium was slightly discoloured with altered blood towards the cornua.

DISCUSSION.

This appears, from the bacteriological and post-mortem findings, to have been a case of staphylococcal meningitis which had its origin in the middle ear. The otitis media was followed by a septicæmia with metastatic abscesses in the lungs, but whether the septicæmia or the meningitis occurred first is a matter of some doubt. Certainly there was no evidence of direct spread from the ear to the meninges. There was no septic focus in the uterus or vagina, and the post-mortem appearances and history of intermittent vaginal discharge were consistent with an abnormally early onset of menstruation.

Increase of Out-patients.—It was stated at the annual meeting recently of the Royal National Orthopædic Hospital, Great Portland-street, that, whereas 20 years ago there were 22,000 out-patients' attendances, last year there were 111,000. Although the cost of maintenance in both departments has been reduced, there is still a debt of £40,000.

New Sussex Hospital for Women and Children.—Princess Mary visited Brighton on May 8th to open the new John Howard wing of this hospital. The trustees of the late Sir John Howard had generously allocated £5000 for building and £20,000 for endowment of this extension, which comprises a ward of cubicles containing 12 beds for poorer patients and six bedrooms for private patients. Miss L. Martindale, M.D., the senior surgeon, made particular mention of the work that is being done at this hospital for the treatment of cancer. In conjunction with three London hospitals the N.S.H. has the use of £12,000 worth of radium. Facilities for encouraging patients to seek early advice was emphasised as one of the aims to be achieved in enlarging the out-patients' department. In connexion with the official opening a public luncheon was held at the Dome with Mr. A. O. Jennings in the chair. Countess Buxton responded to the toast of the hospital and the Sir John Howard Trust. Dame Louise McIlroy, M.D., strongly urged the continuance of the voluntary system, and Miss Irene Vanbrugh made an appeal emphasising the ever-growing requirements of the out-patients' department of the hospital. Over £200 was collected and later presented to Princess Mary.

MEDICAL SOCIETIES

CHELSEA CLINICAL SOCIETY.

At a meeting of this society held on May 19th, Mr. F. J. McCann, the President, being in the chair, a discussion on

Treatment Before and After Operation

was opened by Mr. Lawrence Abel. The art of surgery, he said, was as old as mankind, but the science of surgery, as known to-day, had its seed sown by Joseph Lister. The greatest pre-operative discovery of all time was that of general anæsthesia, for it robbed operations of their outstanding terror—namely, pain. But before this discovery surgeons did not omit provision for lessening the emotional state of the patient before an operation, in illustration of which Mr. Abel read an abstract from the pre-operative injunctions of Sir Astley Cooper before proceeding to operate; "a very elaborate ritual," he remarked. Even now there remained a dread of operations, and even Lister's work did not ban many mediæval practices.

BEFORE.

In considering the patient's fitness for the contemplated operation, the first matter to be investigated was the condition of the heart and the blood pressure. The difference between the diastolic and systolic pressures was known as the "pulse pressure"; the percentage ratio between the pulse and diastolic pressures was the "cardiac energy index"; the normal figure varying between 25 and 75. The cardiac index gave a valuable indication of whether or not the patient had a good chance of surviving the operation. Any doubt on this score should be resolved by taking an electrocardiogram. Especially in hyperthyroidism an ordinary basal determination was necessary to determine the general metabolism, and the lung condition should be inquired into, with a skiagram to supplement if necessary. To look into the genito-urinary system the urine was tested by culture for organisms and by urea concentration. If this was omitted it might be found that the kidneys would not bear the anæsthetic or the post-operative period. The hæmoglobin and urea content of the blood should be estimated, a blood count taken as well as ascertaining the blood group. Should there be any question of jaundice or hæmophilia, the clotting time must be known, also the blood chlorine and cholesterol. A Wassermann test must be included. The degree of thoroughness of this investigation could vary with the severity of the contemplated operation. In a general way, there must be some rest before the operation; several days in bed before a severe operation.

The modern view on purgation before operation was that the patient's normal excretory functions should continue; no aperient other than the accustomed one should be given. Castor oil as often given was a factor in producing dehydration before operation; it gave rise to grossly irregular peristalsis, with stirring up of the intestinal fauna and flora, and not infrequently to impaction of fæces. It might even cause paralytic ileus. Castor oil was, he thought, responsible for more empty cots than any other single cause he knew. In major operations on the large intestine and rectum after several days' preliminary aperients and lavage the bowels should be allowed to rest for two clear days before operation. What was most potent in maintaining the patient's reserve, keeping up the carbohydrate metabolism, and preparing him for the anæsthetic and the insult to his tissues, was glucose. This should be administered, in greater or less degree, to all patients about to undergo operation; it could be given as barley sugar or added to orange or other juices. The patient's ordinary diet should be continued to within three hours of the operation, glucose being added to the drinks taken. Especially on the night preceding the operation should sleep be sound; this could be ensured if necessary by one of several drugs. On the day of operation the aim was that the patient should go to sleep in his bed, and wake up in the same place some hours after the operation. He used a combination of omnopon and scopolamine. Frequently that put the patient to sleep in a few minutes, and after the operation he might not know he had been away from his bed. In using hyoscine it was important to realise that this drug contained two alkaloids; the effect of one was stimulating, the other sedative. These forms were not standardised in the British Pharmacopœia; he therefore procured hyoscine of the sedative type from the continent. Rectal injection of avertin he used occasionally in submaximal doses, but not for abdominal cases, as it caused post-operative paresis of the intestine; nor in cases likely to bleed much. The barbiturates had a distinct sphere of usefulness. Only one anæsthetic was proof against criticism—namely, nitrous oxide and oxygen. This anæsthesia was pleasant to the patient, it was never associated with post-operative complication, after it vomiting was practically unknown; it could be used in young and old, and for every type of operation. Even so, it should be given by a skilled anæsthetist. There was no excuse for using chloroform; it was a powerful poison and should be found only in the hospital museum.

So far, said Mr. Abel, he had presupposed the patient to be in a normal state except for the trouble calling for the operation. No major operation on the mouth or pharynx should be done until the teeth were in a satisfactory condition. Preferably the patient should be edentulous. If heart or lungs were defective, the choice of anæsthetic should receive special consideration. Should the hæmoglobin be less than 50–60 per cent., the operation should be deferred pending feeding up or blood transfusion. If the urea was high, the bladder should be drained, either through a catheter, or suprapubically. Diabetes or excess of sugar in the urine must be recognised before operation and treated accordingly. He always carried glucose and insulin with him when operating in suburbs or provinces. If the projected operation was to be on the biliary passages, jaundice or any hæmorrhagic state must have suitable treatment, with the object of avoiding severe hæmorrhage after the operation. He recommended the intravenous injections of calcium chloride, 10 c.cm. of a 10 per cent. solution, combined with injections of 15 units of parathyroid extract. In jaundice, 500–1000 c.cm. of 10 per cent. glucose in normal saline should be given intravenously the day before operation. If the hæmoglobin was less than 50 per cent. or red cells less than 4,000,000, blood should be transfused. If no anæmia was present, blood transfusion was better deferred until after the operation; then one was sure of a pint of non-anæsthetised blood being in the patient, with a stimulation of the bone-marrow to blood-cell production, and mobilisation of the blood cholesterol. For shocked patients the great standby was morphia. If vomiting occurred before the operation the stomach should be washed out.

AFTER.

In the constitutionally normal patient after operation two factors had to be combated: shock, and the effects of the anæsthetic. For the first of these, warmth was very important: gamgee tissue jacket and hot electric blanket, rest in bed, heroin or morphia, with injections of glucose in normal saline per rectum, subcutaneously or intravenously. Failure of respiration was best treated by injections of alpha lobeline. After an operation which was sure to be followed by considerable shock 500–750 c.cm. of blood should be transfused, preferably before the patient left the table. This measure had resulted in a definite lowering of the mortality after some severe operations, such as that for carcinoma of the rectum. With the patient sitting up there was less danger of lung complications.

About diet there was still much difference of opinion; the question was specially important in abdominal cases. He believed in as complete rest as possible to the alimentary canal. After operation, Nature placed the abdomen at rest, the muscles protectively formed a splint, and peristalsis was inhibited by the painful impulses from the operation site. If the patient had been guarded against dehydration before operation, thirst was not likely to be intense. To allay it the chewing of pineapple chunks might be allowed, the fibre being put out. Milk should be deferred for three or four days; when given it should at first be peptonised. After operation no purge should be given until the bowels of themselves showed signs of activity. After the second day an enema was given; he found turpentine, black treacle, or ox gall very satisfactory. No tubes should be left in the abdomen longer than 36 hours, otherwise there was a liability of spread of infection from skin inwards. Usually his patients were sitting about the ward on the third day after operation; if they could be gently on the move there was less danger of complications and of abdominal weakness.

A serious result of combined anæsthetic infection and shock was disturbance of the carbohydrate metabolism. There was now, he said, a general feeling that what was formerly known as acidosis did not exist as a common post-operative condition; what occurred after operation was rather a state of alkalosis. Whether a patient had excess of alkali in the blood stream or an excess of acid depended on the relative loss of water or salt. If the patient was dehydrated, an acid condition supervened; if the loss of salt was predominant, the patient had alkalosis, even though the urine might be acid. The loss of chloride due to vomiting and to the anæsthetic lowered the osmotic pressure of the blood, leading to retention of bicarbonate in the blood plasma. It occurred sometimes in those who had taken considerable alkali for medical reasons. In a difficult case it was impossible to distinguish between alkalosis and acidosis without making a chemical examination of the blood. Paralytic ileus and acute dilatation of the stomach were caused by excess of alkali in the blood. The prevention of alkalosis consisted in giving 10 per cent. glucose in normal saline per rectum by means of Murphy's drip. If a patient vomited 24 hours after operation, the stomach should be washed out. Some preferred duodenal drain for this. In paralytic ileus pituitrin and cathartics should be carefully avoided; they were like flogging a dying horse. Sodium chloride, with glucose, should be given intravenously for several days. Paralytic ileus was associated with vagal paralysis and the formation of a toxin, similar to that of *B. welchii*. Mr. Abel had had many successes in desperate cases following the use of the direct vagal stimulant, acetylcholine, and with anti-gas gangrene serum.

Discussion.

Mr. CECIL ROWNTREE spoke of the importance of the psychological aspect, which predominated to the patient. Nowadays surgeons had the privilege of working in association with anæsthetists who were keenly alive to this. Patients did not now fear that they would feel pain, but they dreaded the atmosphere of the surgery. Mr. Rowntree agreed that gas and oxygen was the ideal anæsthetic, but it was not always possible to secure its expert administration. Sometimes the patient strongly insisted that his own doctor should give the anæsthetic, and he chose ether, so that this was the drug the patient got—more or less. Every means should be used to ensure skilled anæsthesia. Unlike Mr. Abel, he believed in castor oil in operation cases; having given it, he knew there would be no prolonged distension, and he thought it cut out many post-operative difficulties. He did not see post-operative ileus in his practice, and that might be because he gave castor oil. He had a practical suggestion to offer: it would be a real advance if there were "pre-operative beds" in hospitals; these would be in charge of an enlightened physician—i.e., a physician with surgical leanings—who would assess and report on the risks of each patient.

Mr. H. P. WINSBURY-WHITE said that in urological cases it was very important to avoid diagnostic instrumentation within a short time of the proposed operation. He referred, for instance, to cystoscopy in cases of enlarged prostate. After cystoscopy, a proportion of patients developed retention of urine, while some would have catheter fever—a very unpleasant occurrence before operation. Another undesirable procedure was instrumental pyelography. Intravenous pyelography had now been introduced, and had largely done away with the necessity of the instrumental method. In dilated kidney, where the opaque medium was introduced and could not be withdrawn because there was obstruction, there might be considerable reaction from the irritant medium. When instrumentation was essential a sufficient interval should afterwards elapse before operation. After urological operations careful and unremitting attention should be given to the patients; the surgeon must decide when he would cease irrigation, whether he would use drainage-tubes, and also urethral instrumentation. Bad judgment in these matters was liable to precipitate a dangerous crisis. In preparing bladder cases for operation he had found castor oil excellent; admittedly its post-operative use was bad. For prostate cases, nitrous oxide and oxygen was a good anæsthetic, and he preferred the addition of a little ether. He had seen no disadvantage from the ether.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN.—The number of new in-patients (268), new out-patients (11,824), and out-patient attendances (53,266) last year were all the largest on record, and the annual report notes, as a sign of the recognition of the hospital as a treatment centre for skin diseases, that a third of the new out-patients were sent by medical practitioners. The weekly cost of in-patients (268) has been reduced from £3 11*s.* 11*d.* to £3 3*s.* 10*d.* The length of stay averaged 36 days as against 41 in 1929.

THE INTER-STATE POST-GRADUATE ASSEMBLY OF NORTH AMERICA.

THIS association met in London at the house of the Royal Society of Medicine on May 26th, when Sir THOMAS HORDER, chairman of the British Isles committee, welcomed the delegates and gave an address entitled Some Medical Hints. He deplored the replacement of the aphorism in medical teaching by the lengthy article, and began with some aphorisms on alcohol.

Alcoholism.

The acquired causes of the alcohol habit, he said, were mainly psychological: the drab life of the poor, the ennui of the rich, the state of "misère," and success achieved too early. Alcoholic beverages at the end of the day tended to promote sleep in those accustomed to them and insomnia in those unaccustomed to them. Anomalies of temperature in illness were not seldom explained by alcoholic addiction; morphia might produce the same effect. Spirit-drinking was a potent cause of inflammation of the whole alimentary tract, from gingivitis to colitis and proctitis. Symptoms of duodenal dyspepsia were not infrequently the result of relative excess, and the discomfort was often relieved by resort to the cause—no doubt one of the explanations of the aperitif habit. Hunger with discomfort was relieved by the cocktail, but demanded increasing amounts of the remedy. Alcoholics tended to bleed more often and more profusely than non-alcoholics; hæmatemesis, hæmoptysis, and hæmaturia were all examples. The prognosis in alcoholic cirrhosis was uniformly bad in hospital patients, especially when ascites appeared, but was often better among private patients. In considering the prescription of alcohol in diets it should be remembered that the physician's principle in ordering a regimen was not the most meagre diet on which the patient could live but the diet on which he could live most comfortably and efficiently. The withdrawal of alcohol in the cure of alcoholism must be determined by the individual case. If the main indication was physical—if a tissue craving had been established—the gradual method was probably essential, but if the main indication was psychological, it was often more dramatic and therefore better to break altogether, but the patient must be under close observation. Success depended on the absence of disappointment. A frank talk with the patient and his agreement were a sine quâ non. In doubt, the gradual method was probably safer. In prognosis, the doctor's confidence in the patient's ability to abstain should be in inverse ratio to the patient's own confidence.

Influenza and Some Abdominal Conditions.

There was no exact criterion in the diagnosis of influenza; the nearest approach was a clinical picture more easily recognisable during an epidemic than at other times and varying in different epidemics. The most characteristic lesion was pulmonary—an acute bronchiolitis with weak breath sounds and copious small râles. The signs often seemed quite inadequate to explain the degree of illness and the persistence of the pyrexia. It was a fallacy to think lightly of congestion of the lung. A frank lobar consolidation was far better than a series of congestive patches with no hope of a crisis. The most helpful therapeutic agent available was fresh air, and it was all too often denied to the patient. "A draught" was just what he wanted, but he was often "cooked" with excessive blankets; the amount of bedclothes should be determined by the temperature and not by the patient's feelings. Cradling and sponging were useful.

Abdominal examination was of vital importance. The abdomen should be inspected from the head and foot of the bed as well as from the side, and from the level as well as from above. The question of symmetry was vital; the human abdomen in health was absolutely symmetrical. Auscultation was generally omitted altogether, but every now and then it yielded information of the highest value—e.g., perisplenic friction; or a bruit over a hypernephroma, suggesting a blood-vessel of such magnitude that the patient would be unlikely to survive removal. The distinction between pain and tenderness was significant. The gall-bladder, being contracted and adherent, was often impalpable in cholecystitis. Tuberculous peritonitis was much more often diagnosed—correctly—in the absence of direct evidence of tuberculosis than of its presence; the disease was more often than not confined to the abdomen, especially in children. Even ascitic fluid often gave negative response to tests. One of the most decisive clinical signs was the formation of indurations; these must be distinguished from encysted fluid, tubo-ovarian mating, and appendicular inflammation.

Gastric ulceration was not necessarily malignant because the patient was elderly; age of itself gave no help in differential diagnosis. A frank hæmatemesis highly favoured a diagnosis of simple ulcer Cancer of the stomach and colon was a disease sui generis and was not grafted on chronic ulcer, inflammation, or displacement. The commonest history in carcinoma of the stomach was perfect digestion up till a few months before the patient was first seen.

Mr. DONALD ARMOUR spoke on the

Treatment of Head Injuries.

The treatment, he said, concerned not only the immediate recovery of the patient, but also his ultimate restoration to normality. The damage to the contents was far more important than the injury to the skull itself. "Minor" head injuries often had major sequelæ, and were too frequently neglected. He outlined the anatomy and physiology of the cerebro-spinal and cerebral blood circulations. A delicately balanced equilibrium was maintained, he said, between the production and absorption of cerebro-spinal fluid and the osmotic and hydrostatic pressure of the blood, but gross changes in blood pressure affected the cerebro-spinal fluid pressure. The intracranial pressure depended on five factors: the volume of the blood in the brain, cord, and coverings; the volume of the cerebro-spinal fluid; the volume of the brain; and the tension of the dura and skull. The normal positive pressure depended on the closed-box system of the cranium, variations in volume of either the fluid, blood, or brain being compensated by variations in one of the other two—i.e., in practice by expression of fluid or blood. The margin for their elimination was small, and any increased pressure was bound soon to produce symptoms. Mr. Armour then described the symptoms of interference with the cranial circulation, and the stages of compensation, venous stasis, and cerebral anæmia. If the symptoms were produced by sudden pressure, much greater than that of the blood, the skull was distorted and might or might not be fissured. The effects of deformation were not revealed by inspection of the skull. Early X rays were therefore useless in head injury, and constituted a pitfall in prognosis. The sudden very great increase in intracranial pressure affected all systems, but the choroid plexuses were particularly vulnerable. Symptoms were due to hyperacute compression, producing general cerebral anæmia, and to contusions caused by the deformation of the skull. Any injury of the brain produced œdema leading to venous stasis. Hæmorrhage was the most important result of injury in the production of symptoms, and its rate of progress was the most significant factor. It was important to ascertain the intracranial pressure with a view to prognosis and treatment. The blood pressure was no guide, but the manometric estimation of cerebro-spinal fluid pressure was of the utmost value. Normal pressure varied over a wide range, but pressures above 250 mm. of water were suspicious and over 300 mm. definitely indicated pathological change. Examination of the optic discs for papillary stasis was helpful. Early ocular signs were dilatation of the retinal veins, followed later by blurring of the edges. In local compression ophthalmoscopic examination might have localising value, and the veins of the scalp, forehead, and eyelids might confirm the diagnosis. The absence of blood in the cerebro-spinal fluid did not exclude hæmorrhage, but it seemed that both acute and chronic changes in the central nervous system followed the introduction of blood into the fluid; neuralgic headache, delirium, slight increase of pulse-rate and pyrexia, Kernig's sign, and post-cervical rigidity. The irritating blood should be removed by lumbar puncture or decompression. The value of lumbar puncture was not fully appreciated; in milder cases of tension it often postponed operation until a better time or obviated it. It mitigated the headache, irritability, and vertigo of patients not needing decompression. Intravenous or oral hypertonic saline or glucose reduced intracranial tension; magnesium sulphate had been found to be better than sodium chloride, but the least toxic and most effective solution for intravenous use was dextrose. Cases not requiring operation should be kept in bed, propped up (to reduce pressure), and kept free from all forms of external stimuli. Mild sedatives and purgatives—preferably magnesium sulphate—should be given.

No operation was indicated if there was no increase of tension—i.e., in about two-thirds of the cases of head injury. No operation whatever should be performed during the period of initial shock or in the terminal stage of medullary œdema and collapse. In the absence of increased pressure operation was not indicated. The ideal period for intervention was the stage of capillary anæmia, as shown by a slow pulse and slight rise in blood pressure, in time to avert medullary compression. It was most important to note whether the degree of coma varied with the cerebro-spinal fluid pressure. Mr. Armour then described the operation of decompression.

Dr. STRICKLAND GOODALL spoke on

The Right Ventricle.

He thought that the right ventricle was apt to be neglected. Its function was to supply energy for the pulmonary circulation. The efficiency of the right heart depended on adequate filling, myocardial integrity at the pulmonary base, an efficient tricuspid tensing mechanism, and free outlet. The ventricular contraction started in the right papillary muscle, which tensed the tricuspid valve. The bundle system constituted a large motor end-plate and distributed the stimulus throughout the whole of the myocardium. The tricuspid valve might become cient through dilatation of the ring to which it was attached; through direct damage, as in endocarditis, or through damage or inadequate stimulus to the right papillary muscle. The contractility of the pulmonary base might be affected by infarction or interference with its blood-supply, or by interference with its nerve-supply. The right branch of the bundle of His consisted of two main branches: one crossed in the moderator band to the right papillary muscle and the other arbourised round the pulmonary base. If the main branch were damaged, both valve and base were damaged and the right ventricle only acted by overflow from the left. If, however, the tricuspid branch only was affected the electrocardiographic picture would show normal T_1 but very small R_2. The electrocardiogram showed what the heart muscle was doing, but did not show why. If the base branch was damaged the result would be defective contractility with only secondary reflux through the valve. The T wave in the first lead could thus be inverted in two ways.

The most important relation of the right heart was the stomach which in the young lay immediately beneath it and was fitted with an automatic release to regulate gastric pressure. Therefore in youth there was never any real effective pressure on the heart. With age the arteries lengthened, the heart lost tone, and became triangular and came down on the stomach, which by this time had lost its automatic release so that its pressure varied with its contents. A hard stomach came into contact with a soft heart, and might start fibrillation, extrasystoles, a right ventricular paroxysmal tachycardia, or an anginal attack. In Dr. Goodall's experience, 80 per cent. of heart cases first got symptoms after a meal, and 70 per cent. of unexpected deaths occurred after a meal. Every heart case should be dieted and the stomach attended to from the first. Mechanical embarrassment of the heart should be remediable. Cases could only be properly treated after cardio-analysis.

With age, or after infective diseases, the heart became atonic, sessile, or "concertina"; this was no more characteristic of syphilis than of any other infection. This heart was a large heart, an inefficient heart, a soft heart, boot-shaped in X ray, and showing a slapping apex-beat, with inversion of the T wave in lead III. and left-sided preponderance, and it was often irregular, owing to extrasystoles. It often developed right branch block—obviously enough, since the right branch of the bundle of His was responsible for right ventricular tone. Right branch block might be temporary, during anginal attacks, before death, or in acute right-heart strain; it was often the underlying cause of chronic cough. The commonest variety of block was in the branch going to the papillary muscle and the least common was in that going to the base. There were four main causes of block: mechanical strain, arterio-sclerosis, syphilis, and rheumatism. The prognosis in syphilitic cases was very bad; it was better in the arterio-sclerotic and best in the rheumatic group. Right branch block was not very common in mitral stenosis.

The coupling beat due to overdose of digitalis was always an extrasystole and usually started in the right ventricle, because digitalis was usually given to patients with right-heart strain, and the first expression of poisoning appeared in the most damaged part. If a left-heart failure were poisoned by digitalis the left heart was coupled. Prognosis in mitral stenosis was grave if the T wave in the first lead was poor, indicating thin myocardium about the pulmonary base.

REVIEWS AND NOTICES OF BOOKS

The Medical Annual, 1931.

Edited by CAREY F. COOMBS, M.D., F.R.C.P. Lond., and A. RENDLE SHORT, M.D., B.S., B.Sc., F.R.C.S. Eng. Bristol: John Wright and Sons, Ltd. 1931. Pp. 603. 20*s.*

L'année médicale pratique.

Edited by Dr. CAMILLE LIAN. Paris: René Lépine. 1931. Pp. 635. Fr.26.

WITH this edition the "Medical Annual" reaches its forty-ninth year of useful service to the profession. A number of new treatments for everyday ailments are described, some of which will be of great value to the practitioner. As an example may be quoted the method of firm strapping for chronic ulcer of the leg—a simple procedure which will constitute a great advance if the well-supported claims for its efficacy prove to be justified. Another simple and apparently valuable measure is the "hydration treatment" of epilepsy, while insulin has found two more fields of usefulness in anorexia nervosa and diphtheria. The articles on food and the public health bring out two points which may prove to have great importance: the use of antitoxin for botulism and the increasing incidence of *Brucella abortus* infection. Recent advances in the treatment of colitis and diverticulitis, alcoholism and drug addiction, and high blood pressure are described in detail. Studies in the endocrine system have revealed a hyper-insulinism, analogous with hyperthyroidism, and the usefulness of surgical treatment for osseous disease associated with cyst or tumour in the parathyroid gland. Fresh light is being thrown on blood diseases; for instance, those in which the leucocytic picture is grossly altered, and pernicious anæmia. From studies in the latter disease has been established the interesting fact that persons with a defective secretion of hydrochloric acid are more liable than others to certain diseases. The shortage of hydrochloric acid in the asthmatic child is another observation which may lead to therapeutic developments. The practitioner will find useful hints on the treatment of painful heel, burns, and rectal prolapse. A section new to this volume is that on affections of the teeth, which stresses the value of proper diet and of sunlight. The value of submammary saline infusion before any active interference is undertaken in cases of placenta prævia is discussed in the midwifery section. The section on ophthalmology describes a new occupational disease—a conjunctivitis contracted in the artificial silk industry. The use of contact glasses for conical cornea or ignipuncture for detached retina, and the diagnosis and treatment of pink-eye are discussed. The volume includes, besides its clinical material, an index of new preparations and appliances, a classified list of the books of the year, and of medical institutions, homes, spas, and periodicals, and an official and trade directory, all efficiently indexed. It will be as welcome to the profession as were its predecessors.

The tenth volume of the French equivalent of our Medical Annual includes an index of the volumes from 1927 to 1930. It is a useful little book, though less exhaustive than its British prototype. Illustrations are lacking, except for some electrocardiograms in the article on angina, and two photographs illustrating correction of mammary atrophy by omental graft. The list of contributors is a distinguished one, and the book should be of interest to English as well as French practitioners. It contains, in addition to therapeutic material, a review of those legal enactments passed during the year which concern medical subjects, and a list of pharmaceutical specialties, instruments, and books.

Surgery. Its Principles and Practice.

Fourth edition. By ASTLEY PASTON COOPER ASHHURST, A.B., M.D., F.A.C.S., Professor of Clinical Surgery in the University of Pennsylvania. London: Henry Kimpton. 1931. With 15 coloured plates and 1063 illustrations. Pp. 1189. 45*s.*

THIS text-book of surgery owes much to the clinical experience, judgment, and care of its author. Since practically all of the 1063 illustrations are original and are taken from the author's own cases, we can expect to find in the text the considered opinions of a surgeon of wide knowledge and experience. The work reads pleasantly, and is free from the repetitions of descriptions culled from other sources which make too many text-books dull. The matter is divided into three sections—general, systematic, and regional surgery, and clear, concise descriptions of operative procedures are given, one method of operative treatment at least for each pathological condition. Special regions are dealt with only in so far as they fall within the province of the general surgeon, but within this limit they are adequately discussed. The work is beautifully printed and bound, and the illustrations are well selected and well produced. Dr. Ashhurst has spared no pains in securing illustrations, and, if only for this reason, his book is admirably suited to the needs of the student, whose opportunities of seeing the less common conditions are, of necessity, scant.

Bright's Disease.

Observations on the Courses of Different Types and on the Resultant Changes in Renal Anatomy. By a Group from the Hospital of the Rockefeller Institute for Medical Research, consisting of: DONALD D. VAN SLYKE, EDGAR STILLMAN, EGGERT MOLLER, W. EHRICH, J. F. MCINTOSH, L. LEITER, E. M. MACKAY, R. R. HANNON, N. S. MOORE, and CHRISTOPHER JOHNSTON. London: Baillière, Tindall and Cox. 1930. Pp. 130. 13*s.* 6*d.*

THIS work, which previously appeared in the journal *Medicine*, is now reprinted as Vol. XVIII. of "Medicine Monographs," and so is available in handier form. Many medical men interested in the subject will be glad to preserve what is one of the most valuable publications of recent years concerning Bright's disease. The bulk of its contents is made up by full case reports illustrative of the various types of nephritis, and it is noteworthy that the group of workers responsible adopt, with very minor change, the classification of Volhard and Fahr—that is to say, they recognise three main groups: a hæmorrhagic group, primarily affecting the glomeruli; an arterio-sclerotic group, corresponding to the ischæmic group of many modern writers; and, lastly, a degenerative or nephrotic group. Full accounts of the biochemistry are given in all cases, and the inclusion of post-mortem findings in each instance permits clinical and biochemical data to be accurately coördinated with the histology. English observers familiar with the detailed histology contained in the monograph by Dorothy Russell (Medical Research Council Special Report Series, No. 142) may find the section on morbid anatomy in this volume somewhat disappointing. The American publication, if less exhaustive in detail, is easier to follow, and the adequate attention given to biochemical findings is satisfactory. The student who is accustomed to regard a monograph as a work which includes a review of the literature will be disappointed at the paucity of the bibliography here supplied. The references are quite inadequate for a work of such importance. It is difficult, for example, to understand how the classical work of Gull and Sutton can have been ignored, and perhaps still more remarkable is the omission of all reference by the authors to the work of their distinguished compatriot, A. M. Fishberg.

The last decade has seen a notable revival in scientific interest in medical diseases of the kidney, and this monograph is a worthy contribution to this movement.

Radiations from Radioactive Substances.

By Sir Ernest Rutherford, O.M., D.Sc., Ph.D., LL.D., F.R.S., Nobel Laureate, Cavendish Professor of Experimental Physics in the University of Cambridge; James Chadwick, Ph.D., F.R.S., Fellow of Gonville and Caius College, Cambridge; and C. D. Ellis, Ph.D., F.R.S., Fellow of Trinity College, Cambridge. London: Cambridge University Press. Pp. 588. 25*s*.

The students who were brought up on Rutherford's "Radioactivity," published in 1904, were ready and waiting for his next volume, entitled "Radioactive Substances and their Radiations," which appeared in 1912. This book was soon out of print, and once again an eager crowd, ever increasing in numbers, awaited the publication of another standard work of reference by the author. They had long to wait, but the book now issued is worth waiting for. Praise would be impertinence; one does not praise a revelation of a new world of knowledge. Some idea of the extent of the growth in the subject of radioactivity is gained from the title, about which Lord Rutherford says in his preface: "For these reasons, I have thought it desirable to confine this new work mainly to an account of the radiations from active matter and their application to physical problems. The way in which the long series of radioactive transformations has been unravelled is only referred to in an incidental manner."

This book will be accounted at once as the standard work of reference on the subject for English readers.

John Chalmers DaCosta.

Selections from the Papers and Speeches of John Chalmers DaCosta, M.D., LL.D. By Samuel D. Gross, Professor of Surgery at the Jefferson Medical College, Philadelphia. London: W. B. Saunders Co., Ltd. Pp. 440. 30*s*.

In this large book, but not too large for the range of its subjects, Dr. DaCosta puts together a series of papers contributed to American medical journals, forming the substance of addresses delivered to American medical societies and associations. Philadelphia looms large in the chapters, for they include a character sketch of the famous Prof. Gross, the founder of the professorial chair which the author fills; the stories of the old Blockley and Jefferson hospitals and the oration delivered at the jubilee meeting of the Philadelphia County Medical Society; biographical notes on William Williams Keen, "the most notable figure in the Jefferson Medical College"; and an example of a Samuel Gross oration. Of chapters of more general interest one describes medical Paris during the reign of Louis Philippe; another records the performances of Napoleon's famous military surgeon Baron Larrey; another summarises the virtues and failings of Samuel Pepys fairly; and another gives a detailed description of Dickens's doctors in which the great novelist is found to have treated the medical profession unfairly, but in which, perhaps, too much stress is laid upon the presentations of obvious caricatures. The book, which is dedicated to Prof. Harvey Cushing, should interest many readers.

Grosse Biologen.

Eine Geschichte der Biologie und ihrer Erforscher. By Prof. Ernst Almquist. Munich: J. F. Lehmann. 1931. Pp. 143. RM.8.

Prof. Ernst Almquist, of Stockholm, has written a short history of biology in the form of 23 biographical sketches of men who were curious enough to inquire into its secrets. The book is a sequel to Prof. Philipp Lenard's popular "Grosse Naturforscher," a series of scientific biographies which began with Pythagoras and Euclid, going on through Galileo, Kepler, Descartes to Faraday, Helmholtz, Bunsen, and Crookes. Almquist begins with William Harvey and goes on through Linnaeus, Mendel, Virchow, Pasteur, and Koch to Darwin, De Vries, and Carl von Nägeli, then returning rather surprisingly to Aristotle, Francis Bacon, and John Stuart Mill. He devotes a chapter to the mistaken orientation of present-day biology on which he holds strong views. He finds progress chiefly among those who have done experimental work and have not allowed mere theorising to carry them beyond what can be proven. The book is embellished with admirable photographs and is a stimulating contribution to biologic thought.

REPORTS AND ANALYSES

"ORYO" CRISPBREAD.

(MADE IN SWEDEN.)

ORYO, LTD., 91/3 BISHOPSGATE, E.C.2.

The package contained 8·7 oz. of thin biscuit-like material, the separate pieces (26) measuring 4¼ in. by 2½ in. On analysis the following results were obtained:—

Moisture	6·66	per cent.
Ash	2·40	" "
Fat	1·65	" "
Protein	12·25	" "
Crude fibre	2·00	" "
Digestible carbohydrates ..	75·04	" "
Calorie value (per lb.)	1603	

These figures support the claim that the crispbread is prepared from whole grain rye. By reason of its crispness Oryo is easy to masticate, and this helps the digestive process; in addition it has a very agreeable flavour. As it is cut into slices ready for use, the handling of it before serving is reduced to a minimum. When consumed with butter or other fatty material Oryo constitutes an attractive food material.

THE LANCET.

LONDON: SATURDAY, MAY 30, 1931.

EPIDEMIC JAUNDICE.

DURING the past few months fresh facts have been added to our knowledge of epidemic jaundice. It is evident that there are at least two epidemic diseases characterised by jaundice and by a number of other clinical symptoms in common. These two diseases are leptospiral jaundice and epidemic catarrhal jaundice, or, as Rolleston and McNee prefer to call it, common infective hepatic jaundice. Both diseases appear to be world-wide in their distribution and by clinical means alone their differentiation is by no means easy. It is therefore important that every epidemic should be investigated both clinically and bacteriologically. Such an exhaustive investigation has recently been carried out by J. Taylor and A. N. Goyle[1] on the causation and epidemiology of the jaundice that occurs in the Andamans. Jaundice has been rife in these islands for a very considerable time, and during the last 40 years has been studied by numerous workers. F. A. Barker, in 1926, was the first to demonstrate the presence of leptospira, while two years later, in our own columns, H. C. Brown showed that antibodies to leptospira were present in the blood-serum of jaundiced patients, bringing forward evidence that in the sera examined there were antibodies which, while quite distinct from those produced by the London human and rat strains, were allied to certain strains of leptospira from Sumatra. As a method of diagnosis, Taylor and Goyle find that blood culture is of great value provided it is carried out between the third and sixth day of illness. The serological relationships of the 28 strains of leptospira isolated were also investigated with the result that there appear to be two distinct serological groups. In studying the relationship of *L. icterohæmorrhagiæ* to the Akiyami A strain, K. Yang and M. Theiler[2] have lately raised the question whether it is legitimate to recognise a new strain simply because there is a demonstrable quantitative difference in the potency of the immune serum as manifested for example by the agglutination test. The findings of Taylor and Goyle are, however, so definite that they appear to warrant the serological grouping of the Andaman strains. In discussing the differential diagnosis of leptospiral jaundice, Taylor and Goyle say that in catarrhal jaundice the general pains, albuminuria, conjunctival congestion, and tendency to hæmorrhage are absent. To this it is difficult to agree, for some or all of these symptoms may be encountered in cases of epidemic catarrhal jaundice.

Epidemic non-leptospiral jaundice has also recently received considerable attention both in this country and abroad. One such outbreak, involving the pupils of three schools, was recorded in our issue of March 28th by J. A. Glover and Joyce Wilson, while another has recently been investigated in Surrey by G. M. Findlay, J. L. Dunlop, and H. C. Brown.[3] In its epidemiological and clinical features this Surrey outbreak was very similar to those recorded by W. G. Booth and C. C. Okell[4] in 1928 from Surrey, by M. T. Morgan and Brown[5] in the same year from Northamptonshire, and by W. N. Pickles[6] in 1930 from Yorkshire. The incubation period was found to be a long one and varied from three to five weeks. In leptospiral jaundice, on the other hand, according to Taylor and Goyle, and others, the incubation period is from six to eight days, while V. de Lavergne and Robert-Lévy[7] record an incubation period of about five days when the leptospira gain entrance by the mouth and 15 days when they pass through an injured skin surface. An examination of the differential leucocyte count may also be of service in distinguishing leptospiral and epidemic catarrhal jaundice. Taylor and Goyle, as the result of a very large series of blood examinations, come to the conclusion that the most striking feature of the differential count is the relative increase in the number of polymorphonuclear leucocytes. In epidemic catarrhal jaundice, on the other hand, according to Findlay, Dunlop, and Brown, an increase in the polymorphonuclear leucocytes is present, if at all, only during the first few days of the disease. Instead there is a decrease in the number of polymorphonuclear leucocytes with a corresponding increase in the number of lymphocytes, large mononuclears, and transitional cells. In America, C. M. Jones and G. R. Minot (1923) and E. Thewlis and W. S. Middleton (1925) have recorded similar blood changes in epidemic catarrhal jaundice. In the course of the investigation of the Surrey epidemic numerous unsuccessful attempts were made to transmit the disease to guinea-pigs, and to determine the presence of immune bodies to leptospira in the serum. Efforts to infect monkeys (*Macacus rhesus*) either by the inoculation of blood or by spraying with washings from the nasopharynx of patients in the pre-icteric stage of catarrhal jaundice were also unsuccessful, as were attempts to transmit the disease to rabbits, rats, and mice. The failure to infect Indian monkeys with epidemic catarrhal jaundice occurring in this country is in agreement with the findings of Beeuwkes, Walcott, and Kumm,[8] who were also unable to infect monkeys with the form of jaundice which has recently occurred in epidemic form in West Africa.

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[1] Ind. Med. Res. Memoirs, 1931, No. 20.

[2] Amer. Jour. Trop. Med., 1930, x., 407.

[3] Trans. Roy. Soc. Trop. Med. and Hyg., 1931, xxv., 1.

[4] Public Health, 1928, xli., 237.

[5] Min. of Health Rep. on Pub. Health and Med. Subjects, No. 42, London, 1928.

[6] Brit. Med. Jour., 1930, i., 944.

[7] Presse Méd., 1931, 651.

[8] Trans. Roy. Soc. Trop. Med. and Hyg., 1931, xxiv., 429.

Findlay, Dunlop, and Brown also discuss the relationship of epidemic catarrhal jaundice to acute yellow atrophy of the liver, or, as it is preferably called, acute necrosis of the liver. In this country there has been but one recorded fatal case of epidemic catarrhal jaundice—that reported by Morgan and Brown. Abroad, however, and more especially in Sweden, acute yellow atrophy has occurred almost in epidemic form as a sequela of epidemic catarrhal jaundice. In 1927 acute yellow atrophy of the liver was responsible for 84 deaths in Sweden, 42 cases being met with in Stockholm alone. As H. Bergstrand [9] points out, the initial symptoms of acute yellow atrophy of the liver are identical with those of catarrhal jaundice; then, quite suddenly, there appear the well-known signs of liver insufficiency. The reason why epidemic catarrhal jaundice should be so benign in this country yet on occasions so malignant abroad is at present unknown. Possibly the acute necrosis of the liver is due to some secondary infection which acts on an organ primarily damaged by the epidemic catarrhal jaundice. In certain cases of acute yellow atrophy of the liver Bergstrand, for example, has obtained *Streptococcus viridans* in pure culture from the duodenum. While there is now ample evidence that leptospira are ætiologically responsible for one form of infectious jaundice, there is as yet no indication of the causal agent of epidemic catarrhal jaundice. Failure to isolate any bacterium of ætiological significance does not, of course, rule out a bacterial origin. It does, however, suggest the possibility that epidemic catarrhal jaundice may have to be added to the ever-growing number of diseases caused by ultra-microscopic viruses.

CANCER AND RACE.

ONE of the legends surrounding the cancer problem is that Jews are relatively immune from cancer. Another is that they are particularly susceptible to cancer. Either of these two assertions, if substantiated, would be of considerable general importance, because it would indicate the existence of a factor of racial susceptibility in the ætiology of cancer. The Jews, as ROGERS WILLIAMS has pointed out, are particularly suitable for the investigation of such a problem because, although they have acquired the general habits of the non-Jewish populations among which they live and are subjected to the same general environment, they have maintained themselves racially pure. Dr. SORSBY has attacked this problem by comparing [10] the recorded cancer mortality in various Jewish communities—London, Amsterdam, Vienna, Budapest, Warsaw, Lodz, and Leningrad—with each other and with that of the non-Jewish populations in these different cities. In collecting this material considerable difficulties had to be overcome in order to exclude statistical fallacies which have been clearly recognised by the author. As a result of these investigations the conclusion is reached that the total recorded mortality from cancer varies in different Jewish communities tending to approach that of the non-Jews of each particular city, so that there is no evidence of a racial factor so far as the general mortality from cancer is concerned.

There are, however, striking differences in the organ incidence of cancer between Jews and non-Jews. Thus in all communities investigated the incidence of cancer of the uterus is much lower among Jewish women than among non-Jewish women, the incidence for Jewish women varying from about one-half to one-third of the incidence in their non-Jewish neighbours. The same is true for cancer of the penis among men, not one case of cancer of the penis having been found in the 2252 male cancer deaths recorded among the Jews of London and Vienna, although from the incidence among non-Jews 12 cases were expected to have occurred. A higher organ incidence among Jews was found for the lower part of the gastro-intestinal tract and for the ovaries. These differences in the organ incidence are subjected to a detailed discussion, and the conclusion is reached that they are not due to racial factors but to environmental factors. Thus the immunity from cancer of the penis is attributed to circumcision, while the relative freedom from cancer of the uterus is explained as being the result of the greater sexual hygiene imposed upon Jews by religious prescriptions. This latter explanation seems however hardly consistent with the author's own data. For while it is true that for each community the incidence of cancer of the uterus is always lower for Jewish women than for their non-Jewish neighbours, a comparison of this incidence among the different communities shows extremely wide variations both for Jewish and for non-Jewish women. Thus the Jewish women of Budapest suffer from cancer of the uterus as frequently as the non-Jewish women of Vienna and Warsaw, and even more frequently than the non-Jewish women of Amsterdam. It should be remembered that the recent very detailed investigations carried out by an international statistical committee under the auspices of the Health Organisation of the League of Nations on a closely related question—namely, the notable differences in the incidence of cancer of the breast and uterus in Dutch and in English women—has failed to find any environmental factors which could reasonably be made responsible. As regards the higher incidence of cancer of the intestinal tract among Jews Dr. SORSBY frankly admits that he is unable to offer an explanation.

These differences in the organ incidence of cancer, which may frequently be found when different groups of populations are compared, are indeed very puzzling. What is even more puzzling is the fact, to which attention has been drawn in the recent annual reports of the Imperial Cancer

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[9] Über die akute und chronische Gelbe Leber-atrophie, Leipzig, 1930.

[10] Cancer and Race. A Study of the Incidence of Cancer Among Jews. By Maurice Sorsby, M.D. London: John Bale, Sons, and Danielsson. 1931. Pp. 120. 7*s.* 6*d.*

Research Fund, that the groups of populations in which they occur may nevertheless have the same total incidence of cancer. The most striking example is offered by a comparison of the cancer incidence in men and women in this and certain other countries, a comparison which with an obviously different organ incidence presents an approximately equal total incidence from cancer. Dr. SORSBY's work presents another example of this phenomenon, for in most of the Jewish communities investigated by him men and women suffered in about equal numbers from cancer. Dr. SORSBY offers no comment upon this curious fact. But unless one is satisfied to pass it off as a mere chance effect, which is a priori improbable, this equality in the total incidence of cancer requires an explanation as much as do differences in the organ incidence of cancer. The subject has been discussed in a recent paper by Dr. W. CRAMER[11] in which the view is expressed that the incidence of cancer in man is determined not only by the one extrinsic factor, namely, chronic irritation, but also by an intrinsic factor, namely, the general susceptibility to the development of cancer of the individuals whose organs are being subjected to the various forms of chronic irritation.

ROYAL SOCIETY CONVERSAZIONE.

MANY people who went to the conversazione given by the Royal Society on May 20th probably put the occasion to its proper use and spent most of their time talking to one another. But the exhibits were as well staged and as entertaining as usual, and there was a good deal of medical and biological interest. Dr. J. S. Owens had a further improved model of his automatic apparatus for measuring smoke impurity in the air in which the motive power is supplied by a large weight; it can therefore be used in places where no other source of power is available. We hope that it will be of use in making his methods and results more widely known until we are all ashamed to burn smoky fuel in our houses; his records through the 24 hours conclusively condemn the domestic fire in its present state. Dr. W. B. Brierley showed a film illustrating the formation of the cell inclusions in plants affected with virus diseases, worked out by himself and his colleagues at Rothamsted. The first sign of the inclusions is the appearance of small proteid particles in the streaming cytoplasm of the infected cells. These particles grow larger and fuse into a few big aggregates, and ultimately most of them are contained in a single large mass which finally tends to break down with the appearance of a number of proteid crystals. Cell inclusions, some in the cytoplasm, some within the nucleus, occur in most (but not all) virus diseases in animals and plants; their appearance is often highly characteristic and may be useful for diagnostic purposes as in, e.g., the "Negri bodies" of rabies. Evidence has recently been obtained by Prof. J. C. G. Ledingham and others that in animals these inclusions are made up of a number of minute particles which may not unreasonably be supposed to be the individual elements of the virus itself. The Rothamsted observations suggest that the particles are the result rather than the cause of the disease, though they are not wholly incompatible with the other interpretation, and the bodies in plants may possibly be of a different kind from those found in animal infections. Mr. F. W. Sansome, of the John Innes Institution, had some tomato plants in which a proportion of the adventitious shoots representing regeneration after amputation contained twice the normal number of chromosomes; some of these shoots, amputated in turn, would double their chromosome number again—changes associated with an alteration in the shape of the leaves but leaving the plant otherwise much as before; appearances are due to quality rather than quantity of nuclear material. Animal growth and differentiation was illustrated by a particularly clear demonstration by Mr. C. H. Waddington, of the Strangeways Laboratory. In chick embryos grown in tissue cultures a developing primitive streak, transplanted to another part of the embryo, can induce the formation of a neural plate in ectoderm which would not normally form such a structure; isolated pieces of primitive streak also have this inductive capacity, and duck tissue can act similarly on a chicken embryo. And such are the capacities of growing tissues that the rest of the embryo can regenerate a primitive streak that has been removed. The late Dr. Strangeways was evidently right in thinking that pathologists would learn much from the methods of tissue culture. Prof. Elliot Smith showed the skulls of the Peking man and the Taungs ape, and the Natural History Museum had a case of models of some of the monstrous animals that live in the depths of the sea and pass as fishes. Useful methods for staining bones and cartilage in toto were illustrated by Mr. H. W. Parker and Dr. G. R. de Beer. Rather striking was the large proportion of exhibits which came from research institutes and groups of investigators; the teaching school and the individual worker are progressively becoming less prominent.

BIRMINGHAM HOSPITALS.—Sir Charles Hyde, president of Queen's Hospital, has inaugurated two more beds in that institution, each of the endowed value of £1250, presented by the students of Birmingham University from the proceeds of their last carnival day. Since 1921 the students have contributed £20,698 to the hospital and they have set themselves the task of endowing a whole ward.—Last year 1060 in-patients were admitted to the wards of the Birmingham and Midland Ear and Throat Hospital, a reduction of 468, but their average stay was longer—12·29 as against 10 days. The reduction in numbers is accounted for by the necessity of closing the wards on several occasions on account of infectious cases. There were 9078 new out-patients who made 40,042 attendances. The bulk of the patients of both categories were admitted through the contributory scheme.—The reception hall of the out-patients' department at the Children's Hospital, Birmingham, has been decorated by four students of the Birmingham Art School, under the superintendence of Mr. Collins, the principal. The work, which has taken more than two years, consists of a series of panels, covering the walls of the hall to a height of several feet, depicting the story of Noah's ark.

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[11] Cancer. Festschrift for James Ewing. London: J. B. Lippincott Company. 1931. Pp. 484. 45s.

ANNOTATIONS

A MODERN LINER.

The new Bibby liner *Worcestershire* is a ship of 11,000 tons register (19,000 displacement), 500 feet long, with two Diesel-Sulzer engines, which give her some 340 miles for her daily run, and should take her to Rangoon in about 23 cruising days. She carries 290 passengers (all first class) on four decks amidships, and our representative who visited her at Tilbury found that the old standards of comfort have been far surpassed. On the main deck, specially ventilated by thermotank punkah louvres and by ports, are cabins for 100, and the dining saloon which has, in addition, overhead fans for comfort. On this deck is the doctor's cabin and the surgery. Above it is the main promenade deck, where are the barber's shop and the children's playroom, fitted with see-saw, rocking-horse, and so forth. On the upper promenade deck are, from behind forward, besides the cabins, the veranda café, the smoking-room, and the lounge, while on the upper deck is the drawing-room. On each of the three upper levels are wide stretches of deck, shaded, and it is hoped cool, plenty of room being reserved for games and exercise. The cabins are comfortable; each has a porthole, also a bed, wardrobe, electric fan, fixed basin, and ventilator. The officers are lodged on the navigating bridge, one deck higher. Down below are the usual offices, bakery (coke-fired oven, electric kneader, and ice-cream mixer), cold pantry (electric refrigerator), and the galley, which cooks by coal, oil, steam, or electricity, as suits best the work of the moment. Right aft is the steam laundry, with electric irons for passengers to use. Also at this end is the hospital, and on the decks below are the galleys and other offices for the native crew—mostly from Chittagong. This accommodation is good, and far in advance of the 72 cubic feet per man required by law; they have also good baths and hot water readily obtainable alongside, and their latrines are separated by light bulkheads into cells for individuals. Forward are the European crew, five quartermasters, two deck boys, and 80 stewards. All have iron frame beds with spring bottoms, on iron supports, good-shaped mattresses (the "donkey's breakfast" of old has passed away) and bedding, all provided by the company. There are the usual ventilators and portholes (windscoops also for these), electric fans, radiators, lockers for clothes, and a table and stools, all of which help to make the stewards comfortable when off duty. There are also hot and cold baths for them. The touchstone of the sanitary achievement of a ship is the state of her water-closets, but these were all locked up, the ship being in dock. One key was found of a w.c. for crew; it was a cell of good size, painted white, and there was a closet pedestal with a good flush. It was quite satisfactory, and an enormous improvement on pre-war construction. The others on board were said to be similar; they were also described as supplied with latrine paper, but none was seen here in dock. An unexpected sight was a row of carbonic acid cylinders, to be used for extinguishing unwanted fires.* For protection against damage by grounding, the ship has a double bottom extending all her length. The modern care of dock labourers by the Home Office factory inspection was evident in the long straight ladder-ways to the lower hold (recently ordered), from which cargo was being discharged. This care for these men caused some sarcastic comment from seamen, who felt they were not equally protected; nor in their youth and strength did they need to be. But it is right and much good has been done.

The ships of this line gave satisfaction as hospital ships in the war, and three days before our representative's visit 4000 men, women, and children had been on board in a rally for the good of local hospitals. Yet everything had been put quickly right, and the ship was not only a sanitary satisfaction, but, as every seaman desires, she looked a picture—a credit to her officers and crew.

CRIMINAL LUNATICS.

The latest figures concerning criminal lunacy do not encourage complacency. The Criminal Statistics for 1929 (the latest issued) show that at the end of that year there were 910 criminal lunatics under detention in England and Wales. No fewer than 414 of these had been charged with murder, 140 with attempted murder, 21 with manslaughter, 55 with felonious wounding, and 46 with the misdemeanour of malicious wounding. The danger to public safety is self-evident. Another 28 were charged with rape, indecent assaults on females, or the defilement of young girls. The mere danger to property is illustrated by the total of 31 who were charged with arson. In the face of these figures, the public may begin to realise that there is reason for abating the persecution of medical practitioners who perform the thankless task of certifying the insane. The Mental Treatment Act has raised hopes of better protection for the public as well as of better treatment for the mentally afflicted. Out of 145 criminal lunatics who were received into asylums during the year under review, 45 were "King's Pleasure Lunatics," that is to say, 20 were found insane on arraignment and 25 (four-fifths of whom had been charged with murder) were found guilty of the act charged but insane at the moment of committing it; 100 were certified insane after conviction. Does not this last-named figure suggest that the legal view of criminal responsibility is still too rigid? In how many of these 100 cases must there not have been, before the commission of the criminal act, an abnormality of mind obvious to the medical profession though invisible to the eyes of the law?

Some further information as to criminal lunatics appears in the annual reports of the Prisons Commissioners; the latest report for England appears to be that for 1928. The Medical Commissioner therein states that in addition to the totals of men and women certified as insane in local prisons or found insane by the courts, 1699 men and 504 women were remanded to prison for observation, reports being made later to the court upon their mental condition. It thus appears that there is adequate machinery for inquiry and report; the results indeed must be invaluable to the courts when disposing of the cases of accused persons. But perhaps it is not too optimistic to look for the day when these cases of mental instability will be observed and suitably treated before the patient comes in conflict with the criminal law. Though the Medical Commissioner's report (for 1928) had some interesting comments on encephalitis lethargica and moral deterioration, the rest of the report of the Commissioners for England is not particularly informative as to criminal lunacy. The corresponding report for Scotland (available for the year 1929) gives rather fuller details, especially in respect of the type of insanity of each inmate admitted to the Department at Perth Prison, and in respect of the cost of maintenance.

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* It is worth consideration whether these cylinders can safely be kept in the forward alleyway, just outside several crew spaces. In a collision one or more might perhaps be broken.

PLANS OF CAMPAIGN AGAINST MALARIA.

In the latest annual report of the Ross Institute Sir Malcolm Watson deals at length with the malaria policy of the Institute, and maintains that the proposals of the League of Nations Malaria Commission, as he believes to be advised for Europe, would result in leaving millions of malaria-stricken races in the tropics to struggle helplessly with the disease until they become strong and healthy. He characterises it as one of the most astounding propositions he has ever heard. It should not be forgotten that there are two lines of attack in the antimosquito campaign, antilarval and anti-imaginal. Sir Malcolm, with immense experience of their benefits, naturally lays stress on antilarval measures. The Commission has laid stress on anti-imaginal measures, being, it is clear, convinced that actual infection takes place nearly always in the house. Some of the grounds for this conclusion must be experiences such as that of Watson himself—namely, that to remove the dwelling to half a mile from anopheline breeding grounds, without altering the locality of the daily work of its inhabitants, gives practical immunity from malaria. But if a house can by its very cleanness, lightness, and airiness be made distasteful to the adult anopheles, the same end is attained as if it were placed at a distance from the site of pupal emergence of these imagines; and the possession of a home of this kind is rendered possible only by raising the human standard of life. That there are these two practical and supporting lines of approach to the antimosquito campaign few will question; to determine which is the more useful in particular circumstances seems to give the strongest support to the policy of the Ross Institute, which is one of research and experiment in field and laboratory, undertaken in close coöperation with sanitation, medicine, and industry. Apart from all those considerations of duty and humanity which must bring many subscriptions to the Institute, the sums of money received form, as Sir Patrick Manson is quoted as saying of their like, "an investment yielding a most liberal return to the country that makes them."

THE GERSON DIET FOR DERMATOSES.

THE results recently recorded[1] do not support the more enthusiastic views of previous writers on the Gerson-Sauerbruch-Hermannsdorfer salt-free diet. The cases included four of lupus vulgaris, one of lupus verrucosus, two of varicose leg ulcer, two of chronic ulcer, one of seborrhœic dermatitis, and one of neurodermatitis. In none of the tuberculous cases was a cure achieved, although there was definite involution and inhibition of extension. The two leg ulcers remained in statu quo after four months of the treatment. In the neuroderma case the usual eosinophilia fell from 10 per cent. to 4 per cent., although all previous attempts to influence it, by X rays and other means, had failed. The pruritus was also relieved but relapsed three weeks later. A similar incomplete result was achieved in the case of seborrhœic dermatitis, but both the cases of chronic eczema were discharged cured after two months' dieting—one of them having previously resisted almost every conceivable treatment, as an in-patient for 11 months. Some interesting investigations on the blood calcium, sodium chloride, sugar, and alkali reserve of the blood, and the pH of the urine were carried out at the same time as the salt-free dieting. On the whole there was a slight rise in the calcium content, no change in the sodium chloride, and none that was at all noteworthy in the alkali reserve. The pH of the urine showed a definite movement to the acid side, although no such tendency of the whole organism as is posited by Hermannsdorfer could be demonstrated. In their conclusions the authors say that the Gerson salt-free diet is of considerable value in cases of tuberculosis cutis, and might be found even more helpful when combined with actinotherapy and other methods as is done by Jesionek and others. The main purpose of their investigation was to ascertain the constitutional effects, if any, on the organism as a whole, and in particular how the general change in environment affects the growth and persistence of the tubercle bacillus. They think that further progress awaits elucidation of the essential mechanism of the treatment—which may have some relation to the chloride and water content of the skin itself.

THE LEBANON HOSPITAL.

THIS year sees the thirtieth anniversary of the Lebanon Hospital for mental diseases at Asfuriyeh, Beirut. Thirty years ago the state of the mentally afflicted in Syria was pitiable. Except for a collection of bare and wretched cells in Damascus, there was no provision for their care or treatment, and their fate was almost worse than that of the insane in this country in the Middle Ages. A Swiss missionary, Theophilus Waldmeier, decided in 1896 to retire from the Brummana Mission in order, at the age of 64, to set forth on a crusade to establish an asylum in Syria. He spent two years visiting asylums in England, Europe, and America, and in appealing to a wide public for funds. The hospital, which he opened in 1900, was an international venture. It began as an old farmhouse, amid a few sparse trees, with 15 beds, and untrained mountain girls as attendants. Now there are 219 beds, tended by capable nurses, amid groves of trees and gardens. The annual report[1] shows that during last year 163 patients were admitted, and there were 219 in residence on March 31st, 1931. During the year 48 patients were discharged relieved, 26 recovered, and 16 died. Even in Syria there is a large proportion of voluntary patients, and the hospital consulting-room serves as a valuable out-patient department. There is considerable overcrowding and many applications have to be refused, despite the addition last year of an upper storey to one of the women's pavilions and a new corridor of 11 single rooms for women. Open-air care and occupational therapy were practised at the Lebanon Hospital from the first. The patients are engaged in mattress-making, carpentry, gardening, laundry work, the olive oil soap industry—from the olive trees on the estate—and the making of leban, a form of sour milk. In the early days little or nothing was paid by or for the patients, but now the French Government pay a small capitation fee for the very poor, while the private patients give according to their means. The hospital is a teaching centre; its medical superintendent is professor of psychiatry at the American University at Beirut and holds weekly clinical classes at the hospital. Senior students spend two months as resident assistants and help in the laboratory work. Nurses are also trained here. The London general committee is appealing for financial help for the necessary extension of accommodation and for an endowment fund, and we hope these will soon be forthcoming.

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[1] Schlammadinger, J., and Szép, E.: Med. Klinik, April 2nd, p. 508.

[1] Obtainable from the Secretary, 55, Wellington-road, London, N.W. 8.

THROMBOSIS OF THE ANTERIOR SPINAL ARTERY.

Dr. A. M. Ornsteen,[1] of Philadelphia, who reports two cases of his own, maintains that thrombosis of the anterior spinal artery is commoner than is generally supposed. Acute spinal paralysis may take place without violence to the spinal column, and apart from hæmatomyelia, acute transverse myelitis or vertebral disease. Spinal strain is usually the exciting factor in the thrombosis, but the underlying factor is generally syphilitic disease of the blood-vessels. The clinical manifestations vary according to the extent and level of the occlusion. When the upper portions of the anterior spinal arteries are occluded a bilateral spastic motor syndrome results, giving rise to paralysis of the upper and lower limbs with loss of deep sensibility. Occlusion of the second portion of the anterior spinal artery produces symptoms of amyotrophic lateral sclerosis with dissociation of sensation of the spinal type more or less irregular in its distribution. In obliteration of smaller branches of the anterior spinal artery the symptoms of paraplegia are less marked and do not involve all parts of the extremities. Early and adequate antisyphilitic treatment is advisable in all cases. Ornsteen's first patient was a man aged 54 in whom disturbance of deep sensibility in addition to bilateral pyramidal tract involvement indicated a lesion of the lower part of the medulla oblongata, while atrophy of the shoulder girdle and segmental dissociation of sensation in the right forearm showed that the occlusion of the anterior spinal artery extended down into the cervical region. In the second case, that of a woman aged 24, the symptoms suggested occlusion of the anterior spinal artery in the cervical region. The issue is not recorded in either case.

THE ZÜND-BURGUET TREATMENT OF DEAFNESS.

A FRANK report of his experiences in the treatment of deafness by the electrophonoïde method of Zünd-Burguet has been published by Mr. R. Graham Brown, of Brisbane.[2] After a visit to Mr. Zünd-Burguet in Paris in 1926, he obtained the apparatus and began to use it with enthusiasm, but after carefully observing 40 consecutive cases, he was satisfied that the benefits were very few and slight. He remarks that in deaf people we have not only the deafness and noises in the head to contend with, but also that "fullness in the head" which is a frequent symptom. Most of his women patients believed that this symptom was improved by the treatment, but not so the men; and he observes that deaf female patients are very easily "buoyed up" by almost any form of treatment, and their responses to tests must be carefully scrutinised. In only a few cases was tinnitus lessened to a degree which made the treatment worth while. In the 40 consecutive cases 14 patients were males and 26 females; only three of the males reported any improvement in hearing, two of these relapsed to the previous condition, and the third showed no improvement to tests. Of the 26 females, 12 reported improvement, four of these relapsed, four of the remainder showed no objective improvements on testing; in one the improvement was very slight, and in one a second course gave no result; of the remaining two patients one reported a slight, and the other a very great improvement in hearing. Mr. Graham Brown has given a summary of these 40 cases in tabular form, and has included in the details the presence or absence of tinnitus and of the sensation of fullness; the unsatisfactory nature of the results does not seem to be due to insufficient treatment, for several of the patients underwent very prolonged courses. Negative results, such as these, are not often published, but are useful in assessing the effect of any method of treatment.

GWATHMEY ANÆSTHESIA IN LABOUR.

THE method devised by Gwathmey for procuring painless childbirth has not, we believe, been tried to any great extent in Great Britain. It may be that practitioners shy at the numerous hypodermic and intramuscular injections, in addition to those made per rectum, or it may be that they have been convinced that the claim for "synergism" between morphia and magnesium sulphate has been convincingly disproved by Gwathmey's own countrymen. At any rate, the method has been so little reported on here that the paper[1] by O'Donel Browne will be read with interest. Although he deals with only 41 cases, these have been carefully studied at the Rotunda Hospital, and therefore the conclusions deserve respect. The procedure consisted in: (1) placing the patient in a quiet room and plugging the ears with cotton-wool; (2) when pains occurred at two- to three-minute intervals a soap-and-water enema was given, morphia gr. ¼ hypodermically, and 2 c.cm. of 50 per cent. magnesium sulphate intramuscularly; (3) 20 minutes later a second intramuscular injection of the same quantity of magnesium sulphate was given. Usually two or three hours' relief from pain followed. When this began to wear off the patient was placed in the left lateral position, and the anal region was liberally smeared with vaseline. A small rectal tube containing one ounce of warm olive oil was passed about six inches up the bowel. A bottle containing ether 2½ oz., quinine alkaloid grs. 20, absolute alcohol ♏ xl., and olive oil ʒiii., was warmed in lukewarm water and its contents were allowed to flow very slowly down the rectal tube. Finally, one ounce of olive oil alone was run in. The process took about 20 minutes, after which the tube was withdrawn and a pad of cotton-wool applied to the anus. Introduction of the rectal anæsthetic is made between pains, and above the presenting part. On the average two of these rectal instillations were needed, the time between them being five hours. Browne believes that the magnesium sulphate prolongs the relief given by the morphia without increasing its toxic effect. The bowel was washed out at the end of labour. The average duration of labour, from the time when the cervix was two to three fingers' dilated, was 17 hours in primiparæ and six hours in multiparæ. Ether was eliminated from the child's lungs. There was in no case any need for resuscitation, and delay in the second stage was not abnormal. As regards alleviation of pain, 21 patients had no recollection of any pain after the beginning of treatment, 13 had marked relief, 6 had moderate relief, and only 1 woman was quite conscious of her labour.

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[1] Amer. Jour. Med. Sci., May, 1931, p. 654.

[2] Med. Jour. of Australia, March 28th, p. 375.

[1] Irish Jour. of Med. Sci., April, 1931.

CENTRAL BUREAU OF HOSPITAL INFORMATION.

AN event of importance to all those interested in hospitals is the merging into a Central Bureau of the corresponding organisations of the Incorporated Association of Hospital Officers, the British Hospitals Association, and the Joint Council of the Order of Saint John of Jerusalem and the British Red Cross Society. In the new Bureau all the information previously collected and issued by these bodies is now pooled. The chief activity of the past year has been the preparation of the first edition of the Hospitals Year Book, which retains everything of general interest that previously appeared in "Burdett's Hospitals and Charities." The work has been heavy, but the result will prove to be worth the effort. The Year Book is appearing in two main sections: a report giving particulars of the work done and of finances and kindred matters; and a directory of institutions, with addresses, names of chief officials, and other particulars. In addition to hospitals, dispensaries, and convalescent homes, the Year Book enumerates nursing institutions, homes for the mentally and physically defective, medical universities, and administrative and collecting societies. The publication price has been fixed at 15*s.*, but hospitals and kindred institutions may obtain copies for 10*s.* if they order them direct from the publishers.

In addition to the Year Book, the Bureau publishes memoranda on topics which concern hospitals. During 1930 these publications covered such subjects as outside laundry work for larger hospitals, rubber flooring, working arrangements of X ray departments in hospitals of 50–100 beds, and the cost of building of hospitals recently constructed. Many other memoranda apply to particular districts or groups of hospitals. The advice and assistance which may be obtained from the Bureau is being sought more frequently by boards of management of voluntary hospitals, particularly in connexion with the selection of sites and the preparation of plans for new buildings, or with investigation into the costs of administration. In the course of this work the director has visited hospitals in various parts of the country and the Bureau has prepared reports. He has also visited several towns to discuss local problems with the committees of hospitals, or to address public meetings on behalf of local institutions. The Bureau has also assisted, as in previous years, in the distribution of money raised for a group of hospitals. The list of the Bureau's activities is published in the eleventh report of the Joint Council[1]; it covers more than a full page and embraces topics of amazing variety. Its aims (summarised), in addition to publishing the Year Book, are to collect data concerning all matters of administrative interest; to make inquiries for those responsible for guiding hospital policy; to establish a library of hospital literature, and to act as a clearing house of information. Its services are available without further fee to all hospitals which are members of the British Hospitals Association. An organisation of this kind grows in usefulness in proportion to the use that is made of it, and hospitals can best serve themselves and each other by taking the Bureau into their fullest confidence.

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[1] 12, Grosvenor-crescent, London, S.W.1.

MINERS' NYSTAGMUS.

THERE are two schools of thought on miners' nystagmus, one looking on it as a local affection of the eyes due to long hours of work in darkness, while the other regards it as a manifestation of psychoneurosis.[1] In a paper[2] by Mr. W. J. Roche, of Newport, Mon., both these points of view are recognised. As is clear from Prof. Collis's lectures, reported on p. 1220 of our present issue, the condition is of great economic importance. Mr. Roche says that between 1910 and 1929, with a diminution of the total number of men employed underground, the incidence of the disease increased threefold, despite many of the improvements as to lighting recommended by a committee of the Medical Research Council in 1922. The percentage of the underground workers receiving compensation in 1929 was 1·2, at a cost of £440,000. Yet this only represents a small proportion of the cases of coal-miners with oscillations of the eyes. In the underground workers examined by Mr. Roche they were present (though not necessarily constant) in 23 per cent. The great majority of these men are not incapacitated, and they only have to cease work if such symptoms as vertigo or photophobia supervene. The school which looks upon the oscillations of the eyes as the main feature of the disease is confronted by two puzzling facts—first, that whereas only a small percentage of underground workers are incapacitated, more than 20 per cent. of them show nystagmic oscillations, the great majority without any disabling symptoms; and secondly, that since the general substitution of the one-candle power electric lamp for the old hand lamp the number of men disabled by the disease has not only not diminished but actually increased. In spite of this Mr. Roche believes that the main cause of the condition is defective lighting, and he explains the last-mentioned anomaly by saying that the electric light with clear glass is dazzling, and causes disturbing after-images. The ideal light for mines is the cap lamp worn on the miners' head, but it is heavy and the men do not like it. As a compromise he advocates a four candle-power electric light with frosted glass. He himself, on taking on hewer's work as an experiment, found this much more effective and less irritating than the one candle-power clear glass lamp.

MEMORIALS TO CLEMENS VON PIRQUET.

ON May 12th two impressive ceremonies took place in Vienna at the unveiling of memorials to the late Prof. Clemens von Pirquet, director of the University Kinderklinik, who died in 1929. In the Centralfriedhof, where his grave is among those granted by the city of Vienna to her most distinguished citizens, the memorial takes the form of a sculptured relief symbolic of his work for children, with a portrait in profile by Prof. Müllner. This was unveiled by Dr. Schober, the present Foreign Minister and late

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[1] See annotation in THE LANCET, May 2nd, p. 981.

[2] Brit. Jour. Ophthalmology, April, 1931, p. 211.

Chancellor, and the speakers included Dr. Miklas, the President of the Republic, the American Minister, Dr. Grassberger, the Dean of the Medical Faculty of the Vienna University, and Dr. Tandler, on behalf of the city. They bore witness not only to Pirquet's achievements as scientist and physician, but to his great work for the Austrian children in the years following the late war. Speeches were also made by representatives from the Deutsche Gesellschaft für Kinderheilkunde, the Lister Institute, and the Medical Research Council of Great Britain and the Union International de Secours aux Enfants, while Prof. Nobel, formerly first Assistant at the Kinderklinik spoke on behalf of the pupils of the late professor. The unveiling in the garden of the Kinderklinik of a portrait bust of Pirquet, executed by Prof. Heu, took place in the afternoon and was of a more intimate character. Around the pedestal were grouped numerous laurel wreaths with inscriptions testifying to the international character of Pirquet's work. The ceremony was opened with singing by a choir of children from the tuberculosis sanatorium on the roof of the Klinik which Pirquet founded and in which he always took the deepest interest. After the bust had been unveiled by Prof. Arzt, the vice-dean of the Medical Faculty, there were speeches by Prof. Hamburger, the present director of the Kinderklinik, by Miss Harriette Chick, representing the Lister Institute and the Medical Research Council, with whose researches on nutrition in Vienna after the war Prof. Pirquet generously coöperated, by Dr. Noeggerath of Freiburg for the Deutsche Gesellschaft für Kinderheilkunde, and by Dr. R. Wagner on behalf of Pirquet's former staff at the Klinik and his pupils in general. The matrons of the Kinderklinik and of the Schwesternschule in Dresden spoke of what he did for the nursing profession in Austria and other parts of Europe.

INDUSTRIAL HYGIENE AT THE FRANKFORT CONFERENCE.

THE German Industrial Hygiene Society has an extensive educational programme. No less than 36 brochures dealing with various occupational risks have been issued. Current advances in knowledge are communicated to meetings held in the large German towns to which medical men, scientific technical workers, and factory administrators are invited. Lectures are given to medical men and post-graduate classes held. Much effort is expended on the instruction of the workmen; in Germany they experience the same difficulty as we do in securing cleanliness, and getting the men to wear goggles and use respirators. Fortunately, the leaders of German trades-unions are among the most zealous collaborators of the Society. In a presidential address, delivered to the Section on Industrial Hygiene at the conference held by the Royal Institute of Public Health at Frankfort-on-Maine last week, Lord Leverhulme described a test which is claimed to be of considerable value in preventing accidents, and also in increasing output. Dr. Kurt Seesemann, of Mülheim (Ruhr), uses boards on which are printed in no order of sequence all the numbers between (say) 1 and 25, and 10 and 49. The examinee has to indicate the numbers in their natural sequence with a pointer, and to call them out while he is timed with a stop-watch. It is found possible in this way to discover persons whose perceptive faculties are exceptionally dull, and so to avoid employing them on work at which emergencies frequently arise. Dr. Seesemann claims that these tests also help in the wise distribution of labour in the factory, so that quick workers are not grouped with slow workers who would inevitably lower their standard of output; also that it is possible to discover workers who are particularly sensitive to monotony, and to employ them accordingly. At the same section Dr. E. W. Hope (Liverpool) also emphasised the part played by fatigue in proneness to accidents. One of the early signs of fatigue is a slight incoördination of the muscles, a condition likely to cause accidents. Investigators of the American Public Health Services found that when output rose above a certain level, involving industrial fatigue, the number of accidents showed an accelerated rate of increase—about fourfold, in fact—thus a 5 per cent. increase of output under these circumstances coincided with a 20 per cent. increase of accidents. Fatigue as a factor will be most operative at the end of the shift and day. It appears to affect women more than men; women working on a 12-hour day had two and a half times as many accidents as when working on a 10-hour day, but the men's accidents showed no difference.

WE regret to record that Dr. William Dobinson Halliburton, F.R.S., emeritus professor of physiology in the University of London, died on May 21st at Exeter, at the age of 70.

WE have also to announce the death of Sir Herbert Waterhouse, consulting surgeon to Charing Cross Hospital and for many years president of the Medical Defence Union. He was 67 years of age.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt.-Comdr. T. C. H. Neil is appointed to *Calypso.*

ROYAL ARMY MEDICAL CORPS.

The undermentioned Capts. to be Majs.: J. W. Hyatt, J. R. S. Mackay, P. A. Stewart, E. P. N. Creagh, C. V. Macnamara, F. K. Escritt, and O. A. Whitfield.

ARMY RESERVE OF OFFICERS.

Lt.-Col. W. J. Waters, having attained the age-limit of liability to recall, ceases to belong to the Res. of Off.

TERRITORIAL ARMY.

Capt. J. M. Smeaton to be Maj.

The King has conferred the Territorial Decoration upon Lt.-Col. George Langrigg Leathes Lawson (retd.).

NEW CHILDREN'S HOSPITAL AT LUTON.—On May 13th Sir Harold Wernher formally opened the enlarged building of the Children's Hospital, erected at a cost of £20,000 on a site at the rear of the old Children's Sick and Convalescent Home, which now becomes an administrative block. The new provision includes two wards, each of 20 beds, two single-bed wards, and an operating theatre. The wards were completed last autumn to the design of Mr. S. O. Parrott, but the formal opening has been postponed until the whole scheme, which includes the laying out of some beautiful gardens, was completed. Sir Walter Kent, president of the hospital, in welcoming the guests, made a spirited defence of the voluntary hospital principle and gave some account of its achievement in Luton, including the Bute Hospital paying ward scheme. The new hospital, it was pointed out, would require a larger annual income than before, and one of the visitors expressed his intention of leaving a legacy sufficient to endow two beds.

SPECIAL ARTICLES

THE WORLD CONFERENCE ON WORK FOR THE BLIND.

(BY A SPECIAL CORRESPONDENT.)

DURING the last few years there has been a remarkable development of the international side of the movement for the prevention and alleviation of blindness. An important step was taken by the publication in September, 1929, of a report by the League of Nations on the Welfare of the Blind in Various Countries, the report being based on the replies of 26 Governments to a questionaire issued by the League in response to a request by the British Government in 1927 that inquiries should be made to ascertain what was being done in various countries for the welfare of the blind. This report, though dealing primarily with the provision made for the welfare of persons who have become blind, contains much valuable information on the causes and prevention of blindness, and constitutes the most comprehensive description that has yet been given of the modern movement for the prevention and alleviation of blindness. The appearance of the report coincided with the foundation of the International Association for the Prevention of Blindness, which held its first session at Scheveningen, Holland, at the conclusion of the International Congress of Ophthalmology, which had taken place there and in Amsterdam in September, 1929. The second annual meeting of the board of governors of the Association was held in Brussels in October, 1930, when it was decided to set up national committees in the affiliated countries, and a British committee is now in process of formation.[1]

But the importance of preventive work must not be allowed to obscure the necessity of alleviating the lot of those who have become blind. Accurate statistics of the prevalence of blindness can hardly be said to exist, but it has been estimated that if blindness be defined in economic terms—e.g., as in the Blind Persons Act, 1920, which defines a blind person as one who is "so blind as to be unable to perform work for which eyesight is essential"—the number of blind persons in the world is probably not less than 6,000,000. The problems of alleviation therefore cover an extensive ground.

Blindness may be alleviated in many ways, but obviously the most effective is to provide the blind person with a useful and remunerative occupation. It was to explore the possibilities of this form of alleviation that the President of the United States in March, 1930, issued invitations to 50 countries, asking them to send delegates to a World Conference on Work for the Blind, to be held in New York City in April, 1931. The invitations were sent out at the request of the American Foundation for the Blind, the American Association of Institutes of the Blind, and the American Association of Workers for the Blind.

OBJECTS OF THE CONFERENCE.

Briefly stated these were:—

(1) To promote international comity by bringing about more intimate personal acquaintance among leaders in work for the blind in the various countries.

(2) To give workers for the blind detailed information regarding activities in other countries which *may suggest* ways of improving the work at home.

(3) To establish means of effecting more rapid interchange of information regarding developments in work for the blind as to: (*a*) practical types of employment; (*b*) methods of instruction; (*c*) new appliances for overcoming the handicap of blindness; (*d*) prevention of blindness.

(4) To promote the coöperative use of embossed literature through interchange of books and sheet music among libraries, and exchange of periodicals, especially among countries speaking the same language. (NOTE.—This exchange of periodicals may be carried on both by publishers and by individual readers.)

(5) To enlist the coöperation of workers for the blind in various countries in the promotion of work of international interest, such as the establishment of uniform codes among countries speaking the same language, and furthering the movements to establish uniform embossed codes for music, classical languages, and higher mathematics.

Delegates from 34 countries, including ten from Great Britain, attended the conference, which, after a reception at the International House on April 13th, was held at the Pennsylvania Hotel, New York, from April 14th to 17th inclusive. On April 19th the foreign delegates were taken on a nine-day tour of visitation to representative agencies for the blind in Philadelphia, Washington, Pittsburgh, Cleveland, and Boston. In Washington the delegates had the honour of being received by the President and Mrs. Hoover, and the tour included a visit to Niagara Falls. The conference was re-convened on April 29th in New York, where the final session was held on the following day.

WORK FOR THE BLIND.

At the present time the labours of those who seek to secure remunerative employment for the blind are rendered unusually difficult by reason of the prevailing industrial depression and consequent widely spread unemployment. Moreover, the development of modern industry has seriously affected some of the hand industries which have been regarded as specially suitable for the blind worker. In the field of basket-making and brush-making, for instance, the market is flooded with cheap machine-made articles. The rapid increase in the popularity of the gramophone and the radio has lessened the demand for teachers of the pianoforte, and also for pianoforte tuners, these callings being amongst the most lucrative in which blind persons without exceptional gifts can engage. The development of the "talkies" has similarly reduced the opportunities of blind musicians for finding employment in cinema theatres.

Notwithstanding these disadvantages, the conference afforded ample evidence that in many countries blind persons are to a surprising extent making good in a large variety of occupations. The employed blind may be ranged into four groups: first, those who have set up for themselves in business or professions; second, those who are employed side by side with sighted workers in factories and commercial undertakings; third, those employed in sheltered workshops; fourth, those working in their own homes under the supervision of an agency for the blind. The first group comprises persons of exceptional gifts who have profited by a sound general education and vocational training. For those who have aptitude for business a commercial enterprise normally offers the most promising opportunities for success, and, in America particularly, considerable numbers of blind persons are occupying business positions of responsibility and importance. The blind have made a successful entrance into various fields of professional activity. In Germany there are 41 blind lawyers, and 15 blind parish clergymen, and four important professorships are held by blind men. In France, special attention has been devoted to the training of the blind for the musical profession, and among the past pupils of the *Institution Nationale des Jeunes Aveugles de Paris* are several organists who have achieved distinguished success, such as Mr. Louis Vierne and Mr. André Marchal, who have recently made concert tours in the United States. In the provinces, eight graduates of the *Institution Nationale* are cathedral organists.

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[1] THE LANCET, March 14th, 1931, p. 605.

The main problem, however, is to find employment for persons without conspicuous ability—for the rank and file; and it is encouraging to note that experience steadily increases the number of occupations in which blind persons can work with success. In Germany, where the disablement law of 1920 requires that 2 per cent. of employed labour shall be disabled, promising results have been obtained from the employment of blind workers side by side with sighted workers. In this respect the Siemens-Schuckerts Company have set a notable example. The blind persons employed at the firm's factory near Berlin had had no previous technical training, and nearly all would have been classified as unemployable. They were put to simple operations and quickly became proficient. The firm state that 70 per cent. of their blind workers are of normal efficiency.

An interesting paper on the subject of finding employment for the blind in work for which eyesight was formerly considered essential was read by Captain E. A. Baker and Mr. J. F. Clark, of the Canadian National Institute for the Blind, who pointed out that the problem of securing a job for a blind person was essentially one of salesmanship. There is a good deal of disinclination among employers to offer jobs to blind persons, and "placement" officers must not only be well informed as to the capabilities of blind workers but must also possess "sales ability."

THE PRINTING VISAGRAPH.

One of the most remarkable of the conference exhibits was the "printing visagraph," which was demonstrated by its inventor, Mr. Robert E. Naumburg, of Cambridge, Mass. The object of the visagraph is to enable blind persons to read printed matter that has not been issued in Braille or other embossed type. The instrument produces on a thin sheet of aluminium a magnified image of a printed page, and is intended for use by the blind person himself. It resembles a flat-top desk used in offices, and consists of two parts—the sending part and the receiving part. On the left half of the instrument—i.e., the sending part—the book which it is desired to read is pressed upward, right side up, against a flat glass plate. Above the book is the "lighthouse," which contains a lamp and a selenium, or photo-electric cell, sensitive to light. The "lighthouse" travels along the printed line from left to right, and as it travels the letters of the line are reproduced in embossed letters on the aluminium sheet on the right-hand half of the instrument—i.e., the receiving part—and can then be read as they appear on the sheet by the fingers of the blind reader.

MISS HELEN KELLER.

To many of those attending the conference the most memorable event was the appearance at the opening meeting on April 13th of Miss Helen Keller, who gave an address of welcome, which was repeated sentence by sentence by Mrs. Macy. Miss Keller remained on the platform until the end of the meeting, and followed the speakers closely, the speeches being communicated to her by Mrs. Macy through the medium of the finger alphabet. Miss Keller, as is well known, has been blind and deaf since she was 18 months old, and her attainment to her present position, in spite of the stupendous disadvantages of total deprivation of sight and hearing, is surely one of the most outstanding triumphs of the human spirit. The presence at the opening meeting of this beautiful, accomplished, and radiantly happy lady was an event of good omen for the conference, and there were many who agreed with the remark of one of the delegates that it would be a good thing if the world's pessimistic writers could be collected into that room to look at Helen Keller.

MEDICINE AND THE LAW.

Illegal Sale of Horticultural Poisons.

On May 19th successful prosecutions were undertaken in the Birmingham police-court by the Pharmaceutical Society against three companies and eight individuals in respect of the sale of poisonous substances for horticultural purposes. The preparations, apparently intended as an insecticide for fumigation of green-houses and similar uses, contained nicotine to an extent which made them a deadly poison. Section 4 of the Poisons and Pharmacy Act of 1908 allows persons who are not duly registered pharmaceutical chemists or chemists and druggists, to sell poisonous substances "to be used exclusively in agriculture or horticulture for the destruction of insects, fungi or bacteria, or as sheep dips or weed killers which are poisonous by reason of their containing arsenic, tobacco or the alkaloids of tobacco," provided that the seller has a licence from the local authority and that he complies with prescribed regulations. The Section further provides that such licensed seller is not to be exempt from other requirements under the Pharmacy Act of 1868. Article 14 of the Regulations made in this connexion in 1909, as modified by fresh provision successively in 1911 and 1920, requires that the poisonous substance be sold in an enclosed receptacle distinctly labelled with the name of the substance and the word "Poison" and with the name and address of the seller, and also with a notice of the special purpose for which it has been prepared. The Regulations also require that the licence shall set out on the back *inter alia* Section 17 of the 1868 Act, which directs the seller to enter all sales in a book. The defendants charged at Birmingham had apparently omitted to label the substance as "Poison," to print on the wrapper their name and address, and to enter the sale in the register. Each defendant was fined £1 11*s*. 6*d*. with costs.

The incident is instructive in view of the changes contemplated by the Pharmacy and Poisons Bill which proposes to repeal, amongst other enactments, both Section 17 of the 1868 Act and Section 4 of the 1908 Act. There has been not a little criticism of the fact that the provisions which the Bill proposes to substitute will take away from the qualified pharmacist a considerable part of his work and give it to unqualified persons who do not understand the nature of the dangerous substances which they are allowed to handle.

Carbon Monoxide Poisoning.

A jury lately awarded £1700 damages to a child whose parents had been found dead in the bathroom of a house at Carshalton. The senior Home Office analyst stated that death was due to coma following inhalation of carbon monoxide; the plaintiff's case was that gases generated by a gas-burner in the kitchen had found their way into the bathroom by way of the linen-shoot. As usual the cause of action was framed both as breach of contract and breach of duty. The claim alleged that the house was not fit for habitation but dangerous by reason of the gas-burner not having a chimney flue pipe or other outlet; further, that the burner was negligently installed so that the products of combustion were emitted direct into the house. The defendants (from whom the deceased man had taken the house) knew, argued the plaintiff's counsel, of the existence of a dangerous trap, or ought to have known of it, and were under a duty to warn the occupier. The defendants denied all these allegations. The jury found that death was due to carbon monoxide coming from the boiler, that the gas-heater installed by the defendants had no flue and, in connexion with the shoot to the bathroom, was dangerous for use in a dwelling-house, and, finally, that the defendants did not know it was dangerous but ought to have known it. On the effect of this last finding legal argument was necessary. Defendant's counsel said that, if the danger had been concealed, his clients would have been equally liable whether they knew or ought to have known of its existence. But here there was nothing concealed; the dead householder could see all that the defendants could see. The gas-heater, he said, was not dangerous in itself, though it might be dangerous through defect in its construction or the way in which it was worked. The defendants, he argued, had only the duty to give warning of the danger actually known to themselves, and the jury had found that the defendants had no knowledge which could be communicated. Mr. Justice Hawke ruled that the findings of the jury amounted to a decision that the defendants had been negligent in dealing with a dangerous thing (presumably the gases generated by the boiler in the kitchen); he gave judgment for the plaintiff but granted a stay of execution pending appeal. It is the kind of case that may occur elsewhere and, as there seems to be some uncertainty as to the legal liability, an authoritative ruling will be welcome.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

THE SWEEPSTAKES AMENDING BILL.

AN interesting debate took place in the Dáil last week on the second reading of the Sweepstakes Amending Bill, or, to give it its proper title, the Public Charities Hospitals (Amendment) Bill, 1931. The Bill proposes to enlarge the scope of the principal Act in two directions, so as to include new classes of hospital. In the first place, five institutions are included by name. It is understood that these institutions are ineligible under the present Act, in that they do not maintain the requisite number of free beds. In the second place, one-fourth of the proceeds is to go to the county—i.e., rate-supported—hospitals for the purpose of improvement or equipment; "the idea being," said the Minister, "that none of the proceeds should go to the maintenance of patients or directly to the relief of the rates." (One may ask whether equipment is not a duty of the ratepayers, and whether money from an outside source devoted to equipment is not in relief of the rates.) The Bill also provides new machinery for deciding various points concerning sweepstakes by means of a committee of reference which will, in particular, examine the claims of the several charities which apply for participation, and decide on the distribution of the funds. Mr. MacEntee, although not opposing the Bill, pointed out certain dangers in the reliance coming to be placed on sweepstakes. He pointed out that some of the hospitals were being induced to undertake capital expenditure which would impose on them further commitments for maintenance and operation, which, if sweepstakes were to be discontinued, would involve them in grave financial difficulties. On the other hand, Mr. Davin thought that as long as the money was coming from outside countries, there was no reason for discontinuing the sweepstakes, but he thought they should be under the direct control of the State. Sir James Craig thought that some of the hospitals named in the Bill would require scrutiny in committee. As the introducer of the original Act he confessed himself "rather appalled" by the success of the scheme he had started, and he appealed to the Minister to consider whether he should curtail the period for which the original Act was to run. Mr. Good pointed out that while there was a well-informed opinion in favour of amalgamation of the smaller hospitals, the present method of distribution of funds tended to perpetuate the small hospitals, efficient and inefficient. The sweeps might, on the other hand, be used to carry out amalgamation. Several deputies expressed disapproval of the whole system, Mr. Haslett declaring that the Act had made the country a byword among the nations. The Minister, in reply, agreed with Mr. Good that the present would be a suitable time to consider amalgamation, although the question did not arise under the Bill. The second reading of the Bill was agreed to.

SWITZERLAND.

(FROM AN OCCASIONAL CORRESPONDENT.)

A SUCCESSFUL ACTION FOR NEGLIGENCE.

AN interesting case of medical responsibility has just been decided by the Federal High Court. In July, 1927, five children of a family in the Lower Engadine developed an affection of the throat. The local practitioner diagnosed in all cases common sore-throat and, when asked by the parents, strictly denied the possibility of diphtheria. As the disease showed no sign of improvement the surgeon of the next district hospital was called in for consultation, with the result that two of the children were transferred to the isolation hospital at Schuls with the diagnosis of diphtheria. Despite injections of serum they both died within the next few weeks. The father of the children, being of opinion that their death was due to wrongful diagnosis, lodged a complaint against the practitioner and asked damages amounting to francs 10,000. District court and cantonal court dismissed the complaint. Both courts, however, agreed that the practitioner did not make use of all methods, such as bacteriological examination, to detect the nature of the disease; that it was possible, even probable, but not certain, that with immediate proper treatment death could have been avoided. The plaintiff lodged an appeal with the Federal High Court. The appeal was successful and damages amounting to francs 3000 were awarded to the parents. The Federal High Court based its decision on the admission of a causal relation between the insufficient treatment and the death of the children. The High Court further stated that wrong diagnosis alone was not sufficient to hold a doctor responsible. In doubtful cases it was, however, the duty of the doctor to use all modern methods to explore the nature of a disease. If this was not done the doctor was negligent and could be held responsible. Both the district and the cantonal court were of opinion that the plaintiff had to prove conclusively and strictly that death could have been avoided by early treatment with serum injections. In most cases such proof was impossible. It was enough for the plaintiff to show that the negligence of the doctor was the probable cause of death. The Federal High Court regarded as generally admitted that with proper serum treatment mortality in diphtheria had been enormously reduced. Therefore the court in the present case found it sufficiently proved that with proper treatment the two children most probably could have been saved.

OVERCROWDING IN THE MEDICAL PROFESSION.

This little country has been widely blamed for making it increasingly difficult for foreigners to practise within its borders, but the truth is that the profession is becoming more and more overcrowded. In Switzerland we have one doctor to 1244 inhabitants, a proportion which compares oddly with other countries. In Germany there is one doctor to 1494 inhabitants, in Holland one to 1538, in Denmark one to 1613, in Sweden one to 2947. And despite all warnings the entry is increasing. In 1929 117 students qualified in Switzerland; in 1930, 138. The same plethora is to be seen in the dental and veterinary professions. The situation is such as to have given the Federal Minister of the Interior occasion to write in his last annual report: "All our observations make us fear that the medical professions are becoming more and more overcrowded and that their standard will be gradually lowered. The situation must be remedied. The question is only how this can be effected. One of the remedies proposed, the *numerus clausus*, is not available. We shall approach the subject in conjunction with the medical faculties and the professional groups."

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

ALL-INDIA MEDICAL CONFERENCE.

THIS year the conference so named was held at Poona, Dr. Jivraj Mehta presiding. As one of India's leading medical politicians no more suitable president could have been chosen. Each year the scientific veneer of this conference wears thinner and its political nature becomes more apparent. The chairman of the reception committee referred to the "antiquated policy of the medical administration of the country which must be thoroughly overhauled," drawing a picture of mediocre I.M.S. officers being given all the best medical appointments over the heads of more highly qualified independent practitioners. But he had by no means stolen all the president's thunder. Dr. Mehta described the action of the General Medical Council in refusing to recognise certain Indian degrees as an undisguised blessing; while it was important for India to have a central organisation of its own to control and correlate medical education and for securing and safeguarding their rights, he considered it essential that the council should have a non-official majority. He drew the attention of the conference to the fact that it was proposed to exclude licentiates from the all-India register, but did not appear to commit himself to a definite opinion on this point. The Bill in question was originally an official measure and in previous conferences was attacked as an attempt on the liberty of the medical profession; it is now criticised because it is insufficiently comprehensive. There was a suggestion of reprisals in Dr. Mehta's remark that in his opinion one of the first acts of the new council should be to ensure that only persons registrable in India should be employed in the civil, military, or naval forces. At present of course nearly all British qualifications are so registrable. Dr. Mehta did not approve of the intrusion of the I.M.S. into the civil side of medical practice and he took exception to the present method of recruitment. He also criticised the composition of the governing body of the Indian Research Fund and of the way they administered this fund. The rank and file of the conference were not to be outdone by their president; no less than 47 resolutions were passed, nearly all disapproving of something or other. They disapproved of the Round Table Conference because it had been suggested there that European doctors should be recruited to look after the European civil officials; they passed votes of censure on the police for interfering with the Congress first-aid volunteers; they condemned the government for providing an insufficient number of facilities for medical education and then again for building too many medical schools, for not providing sufficiently qualified teachers and for paying their teachers too much, and in fact for everything that they had or had not done. The brunt of the criticism fell on the European officers of the I.M.S. for being incompetent, for being overpaid, and for even existing at all—as far as civil practice was concerned. The Red Cross administration was attacked by an officer who had recently been associated with it. All the resolutions were carried unanimously, but the conference was not very constructive.

MALARIA NEAR CALCUTTA.

The political situation being quieter the daily press have discovered a malaria scare. The flesh of Calcutta's citizens is made to creep daily by headlines such as "Deadly mosquito advancing on Calcutta," "Firebelt to save Calcutta from malaria epidemic," "Aeroplanes may have to be used," and the like. The facts are that a few months ago a somewhat sharp outbreak of malaria at some of the mills a few miles down the river from Calcutta was investigated. *Anopheles ludlowi* was found to be the cause of it; 90 per cent. of the mosquitoes were of this species and of a large number dissected 24 per cent. were found to be infected. The spleen rate in the area was 90 per cent. Most of the spleens were small, suggesting a recent infection. *A. ludlowi* was known to exist further down the river nearer the sea, but had not been found so near Calcutta before, and fear has been expressed that it might invade the salt lakes from whence the prevailing south wind would soon blow them into Calcutta itself. This species has already been reported in certain places on the river north of Calcutta; it is suggested that they may have been carried there by country boats. The director of public health considered the situation serious enough to persuade the Minister in charge of his department to call a meeting consisting of the chairmen of local bodies, the public health authorities, and experts from the School of Tropical Medicine. The general consensus of opinion was that no very drastic action was called for, it was agreed to make a systematic survey of the whole area concerned and special investigation into the local conditions which could have accounted for the recent invasion of this species. The press campaign may do good if it succeeds in drawing the attention of the Calcutta Corporation to the fact that mosquito control might be much better than it is at present.

POPULATION AND DISEASE.

Full figures of the recent census are not yet available, but the first returns show that there has been a considerable increase in the population throughout the whole country during the last decade. Bengal shows an increase of 7 per cent. over the previous census figures. Now that war has been eliminated, pestilence and famine mitigated as population-controlling factors, it is for someone to indicate how the growth of population is to be controlled in future. At present one square mile has to accommodate and support 600 persons on an average throughout the Bengal Presidency. With the diminution in mortality from so-called tropical diseases, such as cholera, plague, malaria, and kala-azar, there has certainly been a considerable rise in the death-rate from tuberculosis. People are flocking to the towns, not only for economic reasons but because of the better water-supplies and the lesser risk of malaria, and Nature is showing her usual tendency to adjust the balance. In his presidential address to the Tuberculosis Association of Bengal, Sir Stanley Jackson spoke in glowing terms of the activities of this association, probably the most useful of which is that of organising house-to-house visits by voluntary workers who give instruction in hygiene. A promising feature of this work is that it has been organised mainly by Indians.

THE HAFFKINE INSTITUTE.

When Waldemar Haffkine, who died in Switzerland last October, went to Bombay in 1893 at the invitation of the Government of India, he could have had little idea of the extent to which the institute which now bears his name would expand. The original laboratory was utilised for the preparation of plague and cholera vaccines. The report for 1929 shows that in addition to the vaccine department, which serves the whole of India and some countries beyond, research in pharmacology, biochemistry, and other directions is being carried on alongside clinical and general pathological work. The institute has in fact become one of the most important medical activities in the Presidency. New work on plague vaccine has been undertaken for the League of Nations, with the aid of grants from the Indian Research Fund, into such problems as prolonging the period during which the vaccine retains its potency, cutting down the time required for production, using agar instead of broth for cultures, diminishing dose and toxicity without loss of efficiency. In two respects progress is recorded. The vaccine has been found to retain its potency for 18 months, or two years when kept in cold storage; the process of manufacture can be cut down from 12 to six weeks without loss of efficiency, which will make it possible to comply more rapidly with urgent demands. On the other hand, the original broth preparation still holds its own, and there is no evidence that toxicity or dosage can be reduced. Work is being continued on the early detection of contaminants, and on the best method of standardising a virus whose minimal lethal dose can be determined within such narrow limits. With regard to treatment, the quest for a more efficacious serum is still being pursued; judging from its effect on animals, the latest product appears more potent than any previous one and it is hoped shortly to test its value in human plague. The halogenomercuriphenols possess a high germicidal power against *B. pestis* in the test-tube and a safe dosage is being determined with a view to therapeutic test. In the pharmacological department the investigation of indigenous drugs continues, but the director remarks that those who look for startling discoveries will be disappointed. The chief value of this inquiry may be to clear away the superstition and tradition on which the indigenous systems of medicine so largely depend. Inquiries are also being made into maternal morbidity, mortality in childhood, anæmia in pregnancy, stillbirth, and tuberculosis. In the Bombay Presidency the bovine type of bacillus seems to play a negligible part in the causation of human surgical tuberculosis; this is in conformity with the fact, previously known, that in Bombay, where they are seldom housed, tuberculosis of cattle is infrequent, whereas in the colder northern regions of India, where they are housed in winter, the disease is more common. Another important feature of the work of the institute is the production of antirabic vaccine. The Paris strain of fixed virus is now being used exclusively for treatment, but it is yet too early to say whether it is better than the strains hitherto employed.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED MAY 16TH, 1931.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 166; scarlet fever, 1469; diphtheria, 897; enteric fever, 26; pneumonia, 1028; puerperal fever, 44; puerperal pyrexia, 91; cerebro-spinal fever, 63; acute poliomyelitis, 5; acute polio-encephalitis, 1; encephalitis lethargica, 16; dysentery, 16; ophthalmia neonatorum, 134. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on May 19th–20th was as follows: Small-pox, 200 under treatment, 8 under observation (last week 232 and 4 respectively); scarlet fever, 1231; diphtheria, 1470; enteric fever, 14; measles, 188; whooping-cough, 435; puerperal fever, 31 (plus 13 babies); encephalitis lethargica, 188; "other diseases," 150. At St. Margaret's Hospital there were 22 babies (plus 7 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 2 (0) from enteric fever, 38 (2) from measles, 11 (2) from scarlet fever, 24 (7) from whooping-cough, 25 (4) from diphtheria, 40 (16) from diarrhœa and enteritis under two years, and 44 (8) from influenza. The figures in parentheses are those for London itself.

West Hartlepool and Tynemouth reported deaths from enteric fever. Only 2 deaths from meningococcal meningitis occurred in London. Five deaths from measles were reported from each of Birmingham and Liverpool, 4 each from Leeds and Sunderland. Birmingham reported 3 deaths from whooping-cough. Diphtheria claimed 4 victims at Liverpool and 3 at Manchester. Diarrhœa was credited with 5 deaths at Liverpool, 3 each at Birmingham and Manchester. Stoke-on-Trent reported 4 deaths from influenza, Stockport 3, no other great town more than 2.

The number of stillbirths notified during the week was 273 (corresponding to a rate of 41 per 1000 births), including 47 in London.

PUBLIC HEALTH SERVICES

SCHOOL MEDICAL SERVICE.

—	No. on roll.	Average attendance.	Routine inspection.	Special examinations and reinspections	Percentage of defects.
County of Leicester..	38,312	34,813	11,006	10,140	16·8
Torquay ..	4,008	3,507	1,279	6,589	21·6
Bootle ..	11,527	10,433	3,520	15,708	35·0

County of Leicester.

Dr. J. A. Fairer's report is so full of information that the routine work must be dismissed in a few words by saying that it is manifestly carried out with efficiency, and though no new schemes have been started in the county during the year there has been a steady development of the orthopædic work, with promise of further coöperation with the city clinic and the opening of several new clinics. The clinic at Coalville is equipped with a visiting orthopædic surgeon and a fully trained masseuse, who gives electrical, radiant heat, and plastic treatment, as well as massage. Throughout the county a special effort is made to include the pre-school children, and Dr. Fairer regrets that the ascertainment of crippling is so incomplete. This work is easier in urban areas where nursery schools are established. Despite difficulties progress has been made towards the supervision of every child from infancy to adolescence. With this ideal in mind there has been established community of staff, carrying forward of information, and availability of treatment. An account is given of a scheme at a central school, where an excellent hot dinner is provided at 3½*d.* per head, with an average gain in weight of nearly half a pound in five months more than in a control group. The girls who assist get valuable lessons in domestic hygiene, and all the children learn good behaviour. Another measure, based on the work of Dr. Corry Mann, is the provision of milk under controlled conditions to 8681 children. In a test group of these weight increased by nearly three-quarters of a pound more in a twelvemonth than in a control group. Dr. J. F. Davidson gives an account of a tour of inspection of physical training; he was struck by the obvious enthusiasm and enjoyment, contrasting with the listless movement in special exercises of ten years ago. Nowadays exercises and games coördinate the whole physical and mental tone. For all school-children, and especially where lighting and ventilation are not up to the mark, there can be no more effective antidote to fatigue than organised games in the open air. A still greater gain lies in the development of sportsmanship and social responsibility. With Dr. Davidson's report should be read that of the chief organisers, who lay similar stress on all-round activities, though they naturally dwell more on ideals and progress than on theoretical achievements. The report contains a study of a scheme for teaching sex hygiene, data on the physical condition of young children, and a continuation of the research on myopia. All this, done in the face of shortage of staff from illness, is evidence of zeal and efficiency.

Torquay.

Dr. T. Dunlop, in his brief introduction to Dr. J. V. A. Simpson's report, says that the high standard of school medical work in the town has been maintained, although there have been no new developments apart from the completion of arrangements with the Torbay Hospital for dealing with tonsils and adenoids. It is a disappointment to us that Dr. Simpson gives no account of his work on ultra-violet rays in the atmosphere, or of the technique and results of his investigation of the ventilation of the sun lounge at the baths. Crippling defects are now dealt with adequately at the clinic in the town which forms part of the county orthopædic scheme. In all other departments the story is one of progressive development, including extension of treatment facilities to the pre-school child. Last May a new school on the Derbyshire plan was opened on ideal premises with individual towel and model cloakroom arrangements for each child, giving opportunity for the school-child to practise the hygienic way of life. Improvements in the old schools will have their influence on the pupils, and through them on home conditions. In many schools the tone has improved; the wearing of school caps and colours has made scholars take a much keener interest in their personal appearance. An excellent account is given of work at the open-air school. Special mention is made of the rheumatic children, of whom a register is kept, each case being studied individually. Owing to the favourable climate several of them can attend the open-air school, though they are kept at home on wet days and obtain rest and medical treatment on the appearance of any active recurrence. Two severe heart cases have been sent to the Rosehill Children's Hospital.

Bootle.

Dr. F. T. H. Wood exemplifies in his writings and actions the widening concept of the functions of school medical service. The old idea of confining the work to the detection and removal of existing defects is being left behind; the newer aims a physical and mental culture. In the words of Si George Newman's report: "Is it a child with som remnants of school information only that the natio needs at 14 or 15 years of age, or is it a child physicall fit and alert, sound in sense and limb, disciplined i body and mind?" The education of children i practical hygiene and development of physique an well-being can be furthered in two ways: the prope teaching of hygiene in schools, and the provision o expert guidance in physical training. Many of th new developments in Bootle are of preventive value Nutrition is being kept up by the provision of mil or milk food to some 3600 children, not because th average standard of nutrition is low (a table show that the average weight was slightly higher in 193 than in any of the preceding four years) bu because the number of children deemed under nourished is higher this year. The demands on th clog fund indicate the growing economic need. Th work of the remedial exercise clinic is also largel preventive, or at least corrective, directed as it i to the improvement of posture and muscular action Many of the defects dealt with are postural, lik spinal curvature and flat feet; habitual, like mouth breathing; or developmental, like rickets: and in the last class, the majority were below school age Special attention is being directed to the preventio of defects already found in children when they ente school. Of the three-year-old children 202 were full examined at the infant consultation, apart from th much larger number partially examined. Nurser schools form part of the programme for the future meanwhile baby classes for children from 4 to were started in four schools, with excellent results Largely preventive, too, is the work of the rheumatism clinic, which has afforded material for a limite inquiry by Dr. McCloskey. His conclusions generall agree with those of other writers, but he find rather more relation of rheumatism to tonsilla enlargements and sore-throats; only 28 per cent. o his cases had no signs or symptoms in the throat The hope is expressed that the teaching of hygien will soon be formally included in the school curri culum; physical training is being greatly influence by instructors who as yet belong primarily to th secondary schools. A brief note shows the excellence of the results.

CORRESPONDENCE

THE CLEAN MILK PROBLEM.

To the Editor of THE LANCET.

SIR,—I have read your leading article of May 9th with great interest, and note that you suggest that we ought to follow the advice of Dr. Savage and enable large local authorities "to require all milk produced or consumed in or entering their area, other than certified or Grade A (T.T.) milk, to be pasteurised." If that suggestion were carried out at an early date it would mean, for all practical purposes, that only an infinitesimal quantity of fresh milk would be available in our large cities. In view of the great improvements in our milk-supplies which are being effected by the milk industry, throughout the country under a voluntary system, and of the necessity for a much more thorough study of the nutritional value of different kinds of milk than has yet been carried out, it would appear that it might be advisable to adopt some less drastic procedure at the present juncture.

The work of Daniels and Stearns,[1] Ladd, Evarts, and Franks,[2] and Lewis[3] appears to demonstrate that there is a real difference in the nutritional values of fresh milk and milk that has been treated. This view is supported by R. A. Fisher and S. Bartlett[4] in their reading of the results of the Lanarkshire experiment. A study of their letter to *Nature* shows that in their opinion the results obtained in this experiment demonstrate that the boys and girls who received raw milk increased both in weight and height much more than those who received pasteurised. They also note that the boys gained greater relative benefit than the girls. This conclusion is very interesting when considered in relation to the work of C. V. Mattick and J. Golding,[5] who fed generations of rats on raw, pasteurised, and sterilised milk, and found that the weights of the bucks were much more rapidly affected by the different types of milk that were given to them than those of the does. The fact that Fisher and Bartlett's conclusions were reached quite independently of Mattick and Golding gives weight to them.

All the recent experiments on milk feeding in schools have demonstrated that those children who received the milk did much better than those who did not receive it. From these results two conclusions may be drawn; first that milk is a wonderful foodstuff, and second that the ordinary diets of these children did not enable them to attain the highest physical standard. This conclusion is confirmed by J. B. Orr and M. L. Clark in a study[6] of the diets of 607 families in Scotland which showed that in fact "the great majority were incapable of supporting the optimum-rate of growth." The chief medical officer of health of the Board of Education in his annual report for 1929 has also stated that "there is evidence to show that there is a large amount of 'subnormality' amongst secondary school-children, not severe enough to be labelled malnutrition, but which judged in relation to the period of the child's life, and the heavy and competitive strain of the secondary school curriculum, may lead to serious conditions of ill-health."

It would appear that at the present time two steps at least are necessary. On the one hand, to ensure that a complete study of the nutritional values of different types of milk shall be carried out; and on the other, to be careful that any legislation which may be passed shall ensure the progress of the production of a clean milk which is free from disease and not be limited to regulations which would tend to reduce the supplies of fresh milk in our large cities to a negligible quantity. This has been the effect of compulsory pasteurisation in all those countries which have hitherto adopted it.

I am, Sir, yours faithfully,
R. STENHOUSE WILLIAMS.

The National Institute for Research in Dairying,
Shinfield, near Reading, May 21st, 1931.

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[1] Jour. Bio. Chem., 1924, lxi.
[2] Archives of Pediatrics, 1926, xliii.
[3] Report of the Certified Milk Conference, U.S.A., 1927.
[4] Nature, April 18th.
[5] THE LANCET, March 21st, p. 662.
[6] THE LANCET, 1930, ii., 691.

AIR MOVEMENT IN SANATORIA.

To the Editor of THE LANCET.

SIR,—As one of the 50 members of a group which visited Canada and America last summer to study tuberculosis, I was struck, as we all were, by the difference in the circulation of air inside their sanatoria and hospitals and ours. This difference is primarily due to the necessity they are under of using meshed nets to prevent insects getting into the wards and verandas. I was reminded myself of the feeling of being in a camp bed netted against mosquito or sandfly. Now, assuming that their results are about as good (or as bad) as our own, does this observation not suggest that we may be overdoing the open-air treatment in this country? I am aware that, now that sanatoria here utilise such methods as artificial pneumothorax, phrenic avulsion, exercises, and so forth, the basic element of open air is not as outstanding a feature in treatment as it was years ago. Nevertheless a patient told me the other day that he had left a sanatorium as they invited him to enter a bed covered with snow—and in my opinion he acted rightly. There must be a number of clinicians still with us who were on the staff of chest hospitals before sanatorium treatment came into being, and it would be of interest to learn what value they set on the movement of air in treatment. Personally I have modified my principles of treatment very considerably. I have been struck too, in motoring through towns and villages in winter time, by the fact that there are no more open windows than there were when sanatorium benefit came into force in 1912.

I am, Sir, yours faithfully,
J. D. MACFIE.

Winsley Sanatorium, near Bath, May 21st, 1931.

CHAIRS OF PHYSIOLOGY.

To the Editor of THE LANCET.

SIR,—In the generous review of my booklet on the history of physiology of the Clio Medica series, which appeared in your issue of May 2nd, attention is directed to the chair of physiology at the University of Glasgow, and the statement is made that when McKendrick succeeded Buchanan in 1876, the title of the chair was changed from "Institutes of Medicine" to "Physiology." This would place it before the Waynflete chair at Oxford, which was created in 1878. Before publishing the statement that the Oxford chair was the second in Great Britain, I inquired of Prof. E. P. Cathcart, of Glasgow, as to the circumstances of the founding of his chair. In a letter dated March 3rd, 1930, he replied that the designation Institutes of Medicine "was changed by Ordinance No. 31, dated 5 June, 1893, to Physiology (without any reason being given in the Ordinance—merely the bald statement)." I realise that the question merely involves a quibble as to the official designation of a chair, for McKendrick, in a very real sense, *was* a professor of physiology in 1876; but if Prof. Cathcart's statement is correct, I believe it justifies the assertion made in my book that the chair of physiology at Oxford was second in Great Britain, being preceded only by the chair at Edinburgh, which was renamed in 1874.

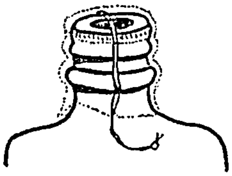
I am, Sir, yours faithfully,
J. F. FULTON.

New Haven, Conn., U.S.A., May 12th, 1931.

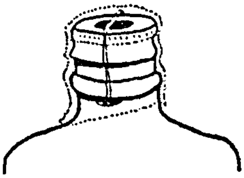
APPARATUS FOR BLOOD CULTURE.

To the Editor of THE LANCET.

SIR,—We have tested the apparatus for blood culture described by Dr. J. E. McCartney in THE LANCET of March 14th, and are satisfied that it is a great improvement on that previously in use in this laboratory, especially in reducing the risk of accidental contamination of the medium. The method of removing the viscap suggested was to run the edge of a penknife around the screw cap, so cutting through the viskap, to insert the point of the knife under the upper half of the viskap, and to flick off the latter. In practice this was not always quite so easy as it appeared, and occasionally the viskap tended to adhere rather firmly to the metal cap. Dr. G. C. Dockeray suggested to me the use of a thread under the viskap as a method of removing this covering, and the following arrangement has now been adopted by us.



Front.



Back.

When the medium has been placed in the bottle and the screw cap tightened, a stout linen thread is firmly tied around the neck of the bottle, below the projecting glass rim which is situated at a lower level than the edge of the metal cap. The two ends of the thread are brought over the top of the cap and down the other side of the neck, and the viskap fitted on. After sterilising and drying, the viskap holds the thread in place. When required for use, the two projecting threads are pulled, so splitting the viskap, which either flies off itself or can be flicked off. The illustrations, for which I am indebted to Dr. H. J. O'D. Burke-Gaffney, make the method of attaching the thread clear. In them the position of the viskap is indicated by the dotted lines.

I believe that this slight modification will still further improve the exceedingly useful apparatus described by Dr. McCartney.

I am, Sir, yours faithfully,
JOSEPH W. BIGGER.

School of Pathology, Trinity College, Dublin,
May 18th, 1931.

HUGHLINGS JACKSON MEMORIAL.

To the Editor of THE LANCET.

SIR,—Since the publication of the letter in your last issue additional subscriptions have come in from Dr. Russell Brain, Dr. Percy Kidd, Prof. Ashley Mackintosh, Dr. F. M. R. Walshe, Prof. Harvey Cushing (Boston), Dr. Bernard Sachs (New York), and Dr. Edwin Bramwell.

I am, Sir, yours faithfully,
WILFRED HARRIS.

56, Wimpole-street, W., May 25th, 1931.

CLINICAL TYPES OF HÆMOPTYSIS.

To the Editor of THE LANCET.

SIR,—Reading your report (p. 1136) of Dr. Hebert's excellent paper at the Tuberculosis Association on May 15th, I am led to wonder whether the classification he suggests is not rather too complicated for practical purposes, and whether indeed it is possible to distinguish clinically between arterial and venous hæmoptysis. The classification which I have advocated for some years is:—

1. The initial hæmoptysis, usually small—say a mouthful—but which may range from a trace only to a large quantity of blood. This indicates active disease, whether it be the first manifestation, or merely an indication of recrudescence, and the treatment for it is the treatment for active disease.
2. The small recurrent hæmoptysis occurring in chronic cases slight or severe, often associated with secondary infections. This can usually be ignored, and the patient reassured.
3. The severe hæmoptysis giving symptoms due to loss of blood, requiring treatment to that end, and often best dealt with by an artificial pneumothorax. Pathologists have told me that these large hæmoptyses often arise from cavities near the root of the lung.

I am, Sir, yours faithfully,
ERNEST WARD.

Paignton, May 26th, 1931.

TUBERCLE BACILLI IN THE BLOOD.

To the Editor of THE LANCET.

SIR,—In the final paragraph of your annotation on this subject on p. 1148 of your last issue there is, I think, a slight confusion as regards the medium. The "asparagin" medium is the latest one employed by Prof. Löwenstein, and although I am experimenting at the present time with this medium, the results published in my article were obtained by the use of Löwenstein's original egg medium.

I am, Sir, yours faithfully,
H. M. SCHWABACHER.

May 27th, 1931.

OVERCROWDING AS A FACTOR IN OUTBREAKS OF CEREBRO-SPINAL FEVER.

To the Editor of THE LANCET.

SIR,—While Prof. Dudley's reply in THE LANCET of April 18th throws further very interesting light on his views, the fresh data he presents may be thought to be not wholly convincing. He supports his objection to my theory in regard to the importance of atmospheric humidity (indoor humidity in particular) as a factor in outbreaks of cerebro-spinal fever by referring to three facts of argument: (1) that the carrier-rate was (presumably during the war period) often as high in ships as in barracks; (2) that the morbidity of influenza and tonsillitis is at times as high to-day on ships as formerly when ventilation was non-existent; (3) that meningitis, in its most general acceptation, was a rare disease in the Fleet over the 20 years 1860–79, when ventilation was as bad in sea-going ships as in training ships.

The reasons to which I wish to call attention are: (1) Gordon's English types I., II., III., and IV., and Nicolle's corresponding French types A and B, of agglutinating sera, for differentiating between agglutinable and non-agglutinable strains (that is, between epidemiological and non-epidemiological meningococci), did not come into general use before the middle of 1916 or early in 1917. As is generally known, the introduction of these sera eliminated much confusion and greatly enhanced the value of subsequent carrier-rate findings. In the absence of qualifying information as to the relative proportions of agglutinable and non-agglutinable meningococci met with, and of *identical* experimental factors, might not the statistical value of comparative carrier-rate determinations be considered a little vitiated? (2) Considering morbidity as a function of bacterial resistance, rather than in the sense implied by Prof. Dudley, the still high morbidity of influenza and tonsillitis infections would surely be explained by the greater resistance of this group of germs to external conditions—e.g., ventilation—than the meningococcus. (3) The meningococcus not being discovered before 1887, can relevant statistics of anterior date be altogether relied upon in a discussion of this kind?—I am, Sir, yours faithfully,

Alexandria, Egypt, May 19th, 1931. A. COMPTON.

OBITUARY

SEYMOUR TAYLOR, M.D. Aberd., F.R.C.P. Lond.,

CONSULTING SURGEON TO THE WEST LONDON HOSPITAL.

WE regret to announce the death of Dr. Seymour Taylor which occurred on May 30th at 21, Wembley Park-drive, in his eightieth year. He had recently retired from practice.

Seymour Taylor was born at Derby in 1851, the son of Mr. Thomas D. Taylor of that town. His preliminary education was received at a private school until he entered the University of Aberdeen as an under-graduate. Here he joined the medical faculty, later completing his medical education at St. Thomas's Hospital, where he was a prizeman. He took the diploma of M.R.C.S. in 1872 and the M.B., C.M. Aberdeen in 1877, proceeding to the M.D. degree in 1881. At St. Thomas's Hospital he was for some time demonstrator of anatomy, and in 1886, while still holding that post, he was appointed assistant physician to the West London Hospital, beginning then his long connexion with that institution. He held the demonstratorship of anatomy at St. Thomas's for another four or five years, and throughout all his clinical work he was always greatly interested in structural anatomy; he was an examiner at different times in the subject at the English Conjoint Board and at the University of Aberdeen. At the West London Hospital he was a vigilant member of the staff, taking especially great pains in the out-patient department with the diagnosis and treatment of the very varied cases which reached the institution. His thoroughness and also his kindness were obvious to his patients, thus removing any impression due to the direct and sometimes abrupt nature of his interrogatories. In 1900 Taylor became full physician to the hospital, and in this year he was elected F.R.C.P. He was also physician to the North London Consumption Hospital, but he made no direct studies of pulmonary disease. He was always a general physician, though he took special interest in cardiology.

Seymour Taylor made considerable literary contributions to medicine and wrote one book which passed deservedly through three editions. This was his "Index of Medicine," which was published in 1894. The simple design of the work was that it should be a handy manual for students preparing for final examinations, and for this purpose the arrangement of the subject matter was admirable, while many practitioners found the volume a handy one for reference. Other contributions deserving of notice are the analyses of the cases of enteric fever treated in St. Thomas's Hospital during the period 1878–1881, and published in St. Thomas's Hospital reports; to these reports, indeed, he made frequent contributions, usually displaying anatomical knowledge. Several papers on aortic insufficiency were published in THE LANCET, and contributions appeared from him in various journals dealing with anatomical points as they came up for notice. He wrote also a series of papers on Acute Pneumonia and another series on Health for the Middle Aged, the latter of which was published in a volume.

Dr. Taylor was consultant physician to the Equitable Assurance Society after many years connexion with that body; and among other interests of an active professional life he was ex-president of the West London Medico-Chirurgical Society, a medical officer to the Board of Education, had been treasurer of the Medical Defence Union, and was on the Council of Epsom College. To the interests of this last institution he was particularly devoted, missing very few meetings of the Council and contributing usefully to its deliberations until shortly before his death.

Dr. Seymour Taylor married Edith, eldest daughter of Edgar W. Bishop, of Hendon Park, Mill Hill.

ALFRED T. MacCONKEY, M.B., D.P.H. Camb.

BACTERIOLOGISTS in all parts of the world who are familiar with the use of MacConkey's medium must have felt that a break with the past had occurred when the death of Dr. A. T. MacConkey was announced. During the past five years he had been living in retirement in Surrey, where he died on May 17th.

Alfred Theodore MacConkey was born in 1861, the youngest son of the late Rev. Andrew MacConkey, of West Derby, Liverpool. He received his scientific training at Caius College, Cambridge, and obtained honours in the Natural Science Tripos. He proceeded to Guy's Hospital, whence he graduated M.B., B.Ch., in 1889. He held the post of senior house surgeon at Guy's, and then settled in practice at Beckenham in Kent. He had acquired a reputation as a sound, capable, and well-liked practitioner, when, after an attack of influenza, he had a nervous breakdown; he decided to abandon general practice and to turn aside into the quieter paths of bacteriological research.

After working for a time with Washbourn and Eyre in the laboratories of his old hospital, he was associated, as bacteriologist, with the Thompson-Yates laboratories in Liverpool under the late Sir Rubert Boyce. His appointment about this time as assistant bacteriologist to the Royal Commission on

Sewage Disposal, whose working headquarters were at Leeds, determined the trend of his researches during the early years of the century. The problems that called for solution fascinated him, and his interests were soon deeply engaged in the technical part of the work. During the period 1900–1909 the results of his investigations were published in a number of papers, which embody his pioneer researches upon the classification of the lactose-fermenting bacteria of intestinal origin, and upon the differential criteria and the significance of this group as contaminants of water, milk, and foodstuffs.

The introduction of his bile-salt medium put into the hands of bacteriologists a simple and effective tool for the separation of the typhoid-dysentery group of bacilli, and it proved of especial value in the estimation of coliform bacteria in the routine examination of water-supplies. Bile-salts had been added to media as early as 1889, and MacConkey's first experiments with them were made in 1897; in 1900 he used a bile-salt lactose agar for the purpose of isolating *B. typhosus* and *B. coli communis.* The addition of neutral red as a differential colour indicator for colonies that either do or do not ferment lactose was suggested in 1902 by Grünbaum and Hume, and this improvement in the method was adopted by MacConkey. He was one of the first to appreciate the importance of noting and comparing the biochemical activities of the intestinal group of bacilli with the object of defining their specific characters and their relationships.

In November, 1901, he joined the staff of the Lister Institute, London, as an assistant in the bacteriological department. The change proved to be the second turning-point in his career, for his transference soon afterwards to the serum department of the Institute at Elstree, then under the charge of the late Prof. George Dean, diverted his energies to the solution of the problems which surround the preparation of toxins and antitoxins. In April, 1906, he became the head of the department, and he remained at Elstree until his retirement in April, 1926, at the age of 65 years. He continued the early work of his colleague, Prof. J. C. G. Ledingham, on serum concentration, and developed the technical processes for refining and concentrating antitoxic sera. There are workers in many countries who owe their practical knowledge of the subject to the information which MacConkey freely put at their disposal. In 1912 he contributed to the reports of the Plague Research Commission in India an interesting paper on the production and titration of antiplague serum, which showed that the specific antitoxin can be concentrated by the usual methods, and that it is associated with the pseudo-globulin fraction the serum proteins.

During the years of the war MacConkey took a keen interest in the prophylaxis and treatment of tetanus by means of antitoxin, and he published several papers on the subject; some of them collated the experience of numerous observers in many countries, and others gave an account of experimental work carried out by himself and his colleagues. He served as a member of the War Office Committee for the investigation of tetanus. In his published articles he entered a strong plea for devoting special attention to the early signs and symptoms of tetanus, on the ground that the antitoxin is likely to influence the disease only when administered as soon as the symptoms are recognisable. The limited response to his appeal and the scanty information which came to hand disappointed him, but it is probable he had not sufficiently realised the difficulty of discriminating between the early subjective symptoms of tetanus and those which were attributable to sepsis, to traumatic shock, and to the nervous strain from which the patients were suffering.

During the war MacConkey put his energies without stint into the task of enlarging and organising his department to meet the increasing demands made upon it by the army authorities for tetanus antitoxin, anti-dysentery serum, and anti-meningococcus serum. The strain of the work weakened his resistance, and rendered him subject to influenzal attacks; these gave rise to an obscure cardiac disability from which he never really recovered.

Dr. G. F. Petrie writes: "MacConkey was a man of a quiet disposition, of simple tastes, and with a natural charm of manner, which was most evident in his home and among the pleasant surroundings of his garden at Elstree, where Mrs. MacConkey and he dispensed amiable and delightful hospitality. He was a lover of animals, and a skilful gardener with a passion for cultivating roses. He was a good raconteur, and possessed a keen sense of humour. He held tenaciously to his opinions, and this feature of his character and the steady persistence with which he pursued refractory technical problems may doubtless be traced to the sturdy independence of the Northern Ireland stock from which he came. The high standard by which he was wont to judge the conduct of others led him at times to assume an unyielding attitude, but those of his friends who knew him best believed that this was a defensive reaction on the part of a modest and sensitive nature; it is certain he followed closely his fine ideals of service."

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

WHITSUNTIDE ADJOURNMENT.

ON May 21st, in the House of Lords, the Workmen's Compensation Bill passed through committee. Their lordships adjourned for the Whitsuntide recess until June 5th. The House of Commons adjourned on May 22nd until June 2nd.

HOUSE OF COMMONS.

WEDNESDAY, MAY 20TH.

Price of Milk in London.

Sir WALTER PRESTON asked the President of the Board of Trade if he was aware that one of the principal retail milk-supplying firms in London was charging 2*s.* per gallon for milk for which they only paid the farmer 9½*d.* per gallon delivered at the London termini; and whether, in view of the importance of milk as a diet for children and invalids, he could take steps to correct the difference between the wholesale and retail prices.—Mr. W. R. SMITH (Parliamentary Secretary to the Board of Trade) replied: I am aware that the usual retail price of milk in London is as stated. The price paid to the farmer under the Terms of Settlement approved by the Permanent Joint Milk Committee varies according to circumstances, but I have no information as to the particular case referred to. I have no power to alter the prices of milk but the Consumers' Council Bill contains provisions which would invest the Board of Trade with certain powers to deal with prices found to be excessive.

Experiments on Living Animals at Reading.

Mr. FREEMAN asked the Home Secretary whether he was aware that Mr. S. P. Male, of Reading, had, during 1930-31, performed a number of experiments on living animals for the purpose of gland grafting, calculated to give pain;

t no licence had been granted to this gentleman; and at action he proposed to take in the matter.—Mr. SHORT nder Secretary for the Home Office) replied: My right n. friend has inquired into the facts of this case and ds that the operations in question were performed by . Male in the ordinary course of veterinary practice for e purpose of treatment of the patients. They were, erefore, not experiments within the meaning of the levant statute, and my right hon. friend has no jurisdiction the matter.

Mr. FREEMAN: Is no licence required in a case of this scription even although pain is caused?

Mr. SHORT: My right hon. friend has no jurisdiction at all.

Infantile Mortality in Scotland.

Miss LEE asked the Secretary for Scotland (1) the counties Scotland where there were the highest and lowest infantile ortality-rates, and the deaths per 1000 in these two unties, and (2) the average infantile mortality-rate for ottish counties.—Mr. WESTWOOD (Under Secretary for otland) replied: The average infantile mortality-rate r the whole of Scotland, excluding burghal areas in 1930, as 69 per 1000 births. The mean of the rates for e individual counties (again excluding burghs) was 61 er 1000. The highest rate was 89 per 1000 in Dunbartonhire, and the lowest was 23 per 1000 in Bute. If my hon. iend intended to include burghal areas, the answer to uestion No. 53 would be that the highest rate was 100 er 1000 in Wigtownshire and the lowest 25 per 1000 in ute; but I should have to make further inquiry as to erage rates.

Public Health Meat Regulations.

Mr. THORNE asked the Minister of Health the date of the scission of the order made under the Public Health Meat egulations, 1908, prohibiting such imports as boxed loins nd legs of pork, boneless beef, and other forms of scrap eat used by sausage manufacturers; the reason for the iginal prohibitions; and what fresh facts were disclosed justify the rescission.—Miss SUSAN LAWRENCE (Parliaentary Secretary to the Ministry of Health) replied: he Public Health (Foreign Meat) Regulations of 1908 and 909 were revoked in 1925, but their substance was re-enacted ith slight modifications by the Public Health (Imported ood) Regulations, 1925. The importation of scrap meat e., meat which affords insufficient means of identification ith definite parts of a carcass) is still prohibited, the reason r the prohibition being that such meat cannot be atisfactorily inspected at the time of importation. Boxed ins and legs of pork have never been regarded as scrap neat and their importation has always been allowed if they re accompanied by official certificates recognised as atisfactory by the Minister of Health. The official certifiate of a number of countries have been recognised for this urpose at various dates from 1909 to 1929.

THURSDAY, MAY 21ST.

Government and the Factories Bill.

Sir KINGSLEY WOOD asked the Home Secretary the present position with regard to the Factories Bill.—Mr. CLYNES replied: As I explained in reply to a previous question the Government have been anxious to proceed with this Bill during the present session if it seemed practicable, having regard to other commitments, to carry it through all its stages. I am afraid that in view of the legislation to which Parliament is already committed, and the present state of business, a postponement of this Bill for the present session appears now to be inevitable.

Shortage of R.A.M.C. Officers.

Lieut.-Colonel FREMANTLE asked the Secretary to the Treasury whether the proposed inter-departmental committee to inquire into the shortage of officers of the Royal Army Medical Corps had yet been appointed; and, if so, if he would state the terms of reference and personnel of the committee.—Mr. PETHICK-LAWRENCE (Financial Secretary to the Treasury) replied: The Committee has not yet been set up. It is, however, hoped that it will be possible to announce its composition and terms of reference in a few days' time.

Lieut.-Colonel FREMANTLE: In the composition of this committee is consideration being given to the fact that a great deal depends on the future career offered in civil life after these officers retire, and is it considered therefore possible to include some representatives of the civil services which employ the services of medical officers?

Mr. PETHICK-LAWRENCE: I am afraid I should have notice of that question.

Insane and Mentally Deficient Persons.

Sir NICHOLAS GRATTON-DOYLE asked the Minister of Health how many insane and mentally deficient persons had been a charge on the funds of the State and local authorities in each of the years 1928, 1929, and 1930.—Mr. GREENWOOD replied: The following is the information asked for:—

Chargeable to the State.

—	On Jan. 1st—		
	1928.	1929.	1930.
Mentally Deficient Persons.			
In State institutions ..	690	785	884
Insane Persons.			
Criminals	803	910	909
In naval and military hospitals	174	163	152
"Service" and "ex-Service" patients	5,543	5,402	5,295
Total (insane) ..	6,520	6,475	6,356

Chargeable to Local Authorities.

Insane Persons.			
—	122,754 (*a*)	125,534 (*a*)	126,941 (*a*)
Mentally Deficient Persons.			
In institutions (under Order)	17,683 (*b*)	19,138 (*b*)	20,629 (*b*)
Under Section 3 (M.D. Act, 1913)	170	172	177
Guardianship	1,143 (*b*)	1,372 (*b*)	1,559 (*b*)
In "places of safety" ..	265 (*b*)	261 (*b*)	216 (*b*)
Total (mentally deficient)	19,261 (*c*)	20,943 (*c*)	22,581 (*c*)

(*a*) Including cases chargeable to board of guardians, and cases in public assistance institutions and in receipt of outdoor relief.

(*b*) 50 per cent. of cost contributed by the State. (N.B.—Under the Local Government Act, 1929, the State contribution of 50 per cent. ceased on March 31st, 1930.)

(*c*) Not including cases under statutory supervision.

Nurses' Hours and Wages.

Mr. BROCKWAY asked the Prime Minister whether the Government was prepared to provide facilities for the further stages of the Nursing Profession (Wages and Hours) Bill.—Mr. MACDONALD replied: I regret that I can hold out no hope of time being found for the discussion of this Bill.

Lieut.-Colonel FREMANTLE: Will the right hon. gentleman recognise that there is no demand for this Bill among the nursing profession, and that it is a political stunt of the Labour party?

No further answer was given.

Co-operative Societies and Insurance Prescriptions.

Sir KINGSLEY WOOD asked the Minister of Health whether he proposed to make such alterations in the present regulations as would permit co-operative societies to make a monetary payment to their customers in respect of national health insurance prescriptions.—Mr. GREENWOOD replied: This matter has been the subject of very recent legal proceedings, and until the period for appeal against the decision has expired it would not be proper for me to make any statement.

Approved Societies' Funds.

Mr. THOMAS LEWIS asked the Minister of Health the amount actually credited to approved societies in accordance with Section 4 of the National Health Insurance Act, 1926, as amended by Section 21 of the National Health Insurance Act, 1928, for the purpose of preventing insured persons who were in arrears from being, or continuing to be, subject to reduction or suspension of benefits.—Mr. GREENWOOD replied: The sum of £500,000 available in respect of arrears in the contribution year ended July 7th, 1929, is in process of distribution to approved societies. The distribution of the £500,000 in respect of arrears in the contribution year ended July 6th, 1930, is awaiting the receipt of returns from the societies.

JEWISH HOSPITALS.—Last year the London Jewish Hospital (108 beds) received 1600 in-patients, a considerable increase; out-patient attendances increased from 60,444 to 65,873, chiefly by reason of patients referred for treatment to special departments. The weekly cost of each in-patient went up from £3 2*s.* 8*d.* to £3 4*s.* 7*d.*—The foundation-stone of the Bernhard Baron extension of the Victoria Memorial Jewish Hospital in Manchester was laid recently by Mr. J. H. Thomas, Secretary of State for the Dominions, Sir Louis Baron, Sir William Cundiff, and Mr. R. Barrow-Sicree. This marks the beginning of an extension, to cost £40,000, which will provide 25 additional beds, 11 private wards for paying patients, two new theatres and other accommodation.

MEDICAL NEWS

University of Cambridge.

On May 22nd the following degrees were conferred :—

Sc.D.—A. S. Parkes.

M.B. & B.Chir.—F. G. Wood-Smith.

Lane Presentation.—The presentation to John Lane, senior steward of the anatomical department, will be made on Tuesday, June 2nd, at 5 P.M., in the Anatomy School. It will consist of a gold watch and chain, together with a cheque, a short address, and a list of the subscribers.

Royal Colleges of Physicians and Surgeons of England.

At the Final Examination of the Conjoint Board, held from April 13th to May 4th, the following candidates were approved in the undermentioned subjects, but are not eligible for the diplomas of the Colleges :—

Pathology.—J. H. Beale, Sheffield ; E. H. S. Bebb, London ; H. T. L. Broadway, St. Thomas's ; S. B. Bromberg, St. Mary's ; J. Burdon-Cooper, Univ. Coll. ; T. Chadderton, Manchester ; Barbara G. C. Clarke, Univ. Coll. ; R. C. Cohen, Univ. Coll. ; J. G. Connell, Sheffield ; F. N. Corfe, L.D.S. Eng., Guy's ; E. H. de B. Crowther-Smith, Guy's ; E. J. Currant, London ; D. Davidson, Univ. Coll. ; R. T. Elven, Guy's ; C. D. Evans, St. Mary's ; A. C. Gladstone, St. Thomas's ; H. F. Green, St. Bart.'s ; A. Greenberg, St. Bart.'s ; H. J. Griffiths, Middlesex ; M. A. F. A. Hadi, Birmingham ; Winifred S. Hall, Univ. Coll. ; W. Hedgcock, St. Thomas's ; A. Hollinrake, St. Bart.'s ; Mary T. Howard, Charing Cross ; S. V. Humphries, St. Thomas's ; B. Hynes, Middlesex ; J. M. Jackson, St. Bart.'s ; Annie L. Jones, Univ. Coll. ; L. Kessel, and J. S. Lane, Guy's ; H. H. Langston, St. Bart.'s ; E. S. Lee, Westminster ; A. A. Lewis, Guy's ; J. T. R. Lewis, Middlesex ; P. Lewis, Leeds ; W. H. Lewis, Guy's ; M. A. Lloyd, St. Bart.'s ; I. A. MacDougall, Guy's ; G. J. McFarlane, St. Thomas's ; J. G. McGrath, Manchester ; J. W. McLaren, St. Thomas's ; R. L. Mansi, St. Bart.'s ; W. A. Mayne, St. Thomas's ; C. F. Mayo-Smith, St. George's ; G. J. Meikle, Middlesex ; T. F. B. Noble, London ; N. C. O'Byrne, St. Thomas's ; C. G. Owen, Edinburgh and St. Mary's ; G. T. Partridge, St. Bart.'s ; R. C. T. Pearson, St. Thomas's ; F. W. J. Platts, King's Coll. ; Joyce A. Pope, Manchester ; C. R. D. Porter, and T. W. H. Porter, Middlesex ; S. Prakash, M.B., Charing Cross ; Eluned M. Puleston-Jones, Lond. Sch. Med. ; H. M. Rashid, Birmingham ; G. F. Rees-Jones, Univ. Coll. ; B. Roberts, Univ. Coll. ; I. C. Robertson, St. Thomas's ; G. Scott, Middlesex ; M. Shankhla, Leeds ; J. R. S. Sharp, Guy's ; R. E. H. Simpson and D. G. Snell, St. Thomas's ; W. P. Stamm, Guy's ; S. Sutton, Manchester ; G. H. Taylor, Guy's ; Winifred P. Thomas, Univ. Coll. ; H. H. Thompson, Manchester ; W. F. Townsend-Coles, London ; Patricia I. Unsworth, Liverpool ; H. C. M. Walton, St. Mary's ; J. H. West, St. Bart.'s ; Shirley E. Whitaker, Univ. Coll. ; H. G. Williams, St. Thomas's ; H. T. S. Wise, King's Coll. ; F. H. Wood, Birmingham ; S. L. Wright, Univ. Coll. ; J. Zeitlin, London.

Medicine.—E. Anfilogoff, London ; E. J. Baldwin, St. Thomas's ; A. V. Baliga, King's Coll. ; K. Baxter, Manchester ; C. M. Bell, St. Bart.'s ; Eleanor H. Brooks, M.B., Royal Free ; C. Budeiri, M.D., London ; Winifred M. Burbury, Leeds ; M. J. L. Burtenshaw, Guy's ; K. V. Earle, St. Thomas's ; Joanna M. Egerton, King's Coll. ; A. G. Evans, Birmingham ; G. A. Fleet, M.D., McGill ; S. G. French, King's Coll. ; M. J. Garber, Guy's ; H. N. Garrus, Guy's ; Rachel N. Gillespie, Royal Free ; V. Glass, Univ. Coll. ; L. Glick, Leeds ; S. Goido, Charing Cross ; A. Greenberg, St. Bart.'s ; G. H. Greenway, Guy's ; G. W. Hall-Smith, Guy's ; S. T. Hayward, St. Bart.'s ; J. E. Jenkyn-Thomas, St. Bart.'s ; D. Johnson, King's Coll. ; A. A. Kidvai, King's Coll. ; E. A. Knappett, Univ. Coll. ; M. Kosloff, Guy's ; N. I. Kronenberg, L.M.S.S.A., Guy's ; B. Lawn, St. Thomas's ; D. T. Lewis, St. Mary's ; H. L. Lightstone, Middlesex ; E. H. W. Lyle, L.M.S.S.A., King's Coll. ; R. M. Marshall, St. Bart.'s ; R. W. C. Murray, Birmingham ; C. G. Nicol, L.M.S.S.A., St. Mary's ; S. Prakash, M.B., Charing Cross ; P. Pringle, King's Coll. ; Eluned M. Puleston-Jones, Lond. Sch. Med. ; J. Reeve, Westminster ; W. F. Richards, St. Bart.'s ; P. Rosenfeld, St. Bart.'s ; Mary A. Saunders, King's Coll. ; M. Schlaff, St. Bart.'s ; G. Scott, Middlesex ; E. Sharp, Guy's ; H. Simmons, St. Bart.'s ; G. L. Stroud, St. Mary's ; R. A. Sykes, St. Bart.'s ; G. Tattersall, Manchester and Univ. Coll. ; A. B. Waters, St. Bart.'s ; M. Westwood, St. Bart.'s ; D. I. A. Williams, Liverpool ; A. H. Zair, Birmingham.

Surgery.—A. M. M. M. Ali, Middlesex ; W. H. Bradbeer, Guy's ; T. E. Burrows, St. Bart.'s ; Beatrice L. Campion, Lond. Sch. Med. ; A. M. Cantor, Guy's ; W. I. Card, St. Thomas's; C. P. Collins, Univ. Coll. ; H. A. Constable, Guy's ; A. B. Cook, St. Bart.'s ; A. H. Dunkerley, Manchester ; S. Durham, and N. M. Durrani, London ; Joanna M. Egerton, King's Coll. ; G. R. Ellis, Liverpool ; L. S. Everett, King's Coll. ; G. A. Fleet, M.D., McGill ; N. A. Gillespie, London ; J. H. L. Gilmore, St. Thomas's ; G. P. Gladstone, London ; A. J. B. Goldsmith, Middlesex ; W. H. Greany, Guy's ; H. N. Gregg, Birmingham ; H. L. Griffiths, Middlesex ; Sheila M. Harper, Liverpool ; D. C. Harris, Middlesex ; F. Hilmy, Durham ; L. C. Holland, Bristol ; J. H. Hughes, Liverpool ; B. Hynes, Middlesex ; K. C. Jeffery, London ; W. P. Jenson, Westminster ; Alice M. Kaye, King's Coll. ; C. A. Keane, St. Bart.'s ; Victoria H. King, Lond. Sch. Med. ; N. L. Lamb, Cardiff and Guy's ; J. S. Lane, Guy's ; A. W. Langford, St. Bart.'s ; N. R. C. Lansdell, King's Coll. ; A. M. P. Laurent, Univ. Coll. ; B. Lawn, St. Thomas's ; R. A. Q. Lay, Guy's ; T. M. A. Lewis, London ; J. Littlejohn, St. George's ; P. H. Lomax, Guy's ; J. R. McBride, St. Bart.'s ; G. J. McFarlane, and J. W. Macmil St. Thomas's ; I. W. H. Mansfield, L.M.S.S.A., Middle P. G. C. Martin, Manchester ; A. Miller, Guy's ; M. A. Moezuddin, St. Thomas's ; A. K. Monro, London ; P. Moroney, Liverpool ; I. Moshinsky, Guy's ; Edith A. Muir Lond. Sch. Med. ; P. G. A. Nambiar, Madras and Lond. Med. ; L. G. Norman, Univ. Coll. ; Lily M. O'Hanlon, Kin Coll. ; C. G. Owen, Edin. and St. Mary's ; G. T. Partri and G. F. Petty, St. Bart.'s ; T. J. Phillips, Univ. Coll. ; A. Potter, Liverpool ; J. Rabinovitch, Leeds ; M. Ripka, Lond H. D. Robertson, St. Bart.'s ; C. H. Rogerson, Guy's ; J. Rowe, St. Bart.'s ; E. Rudkin, Birmingham ; N. L. Ru St. Thomas's ; C. Rutter, Guy's ; E. S. StJohn, Guy's ; J. A. Scott, Middlesex ; R. B. Scott, St. Bart.'s ; E. W. H. Shawcr King's Coll. ; H. Shoukry, Birmingham ; A. B. Simmon King's Coll. ; K. Singh, St. Thomas's ; R. G. W. South St. Thomas's ; P. Q. M. Spaight, St. Bart.'s ; D. Stone, Guy's G. L. Talwar St. Thomas's ; G. W. Thomas, St Bart.'s ; J. C. Vincent-Smith, St. George's ; S. O. Widmann, H. G. Willia and A. L. Wingfield, St. Thomas's ; and Dorothy Woodm Lond. Sch. Med.

Midwifery.—S. S. Alam, M.B., Punjab ; Isha M. Ali, Roy Free ; A. Ascher, King's Coll. ; E. J. Baldwin, St. Thom A. V. Baliga, King's Coll. ; G. N. Barker, St. Thomas's ; C. Bateman, St. Bart.'s ; R. A. Beaver, St. Thomas's ; G. Benjamin, Madras and Guy's ; G. F. Benjamin, Liverpo J. B. Bishop, St. Thomas's ; R. W. Blakey, Leeds ; J. Blumovitch, St. Bart.'s ; H. E. Bonnell, King's Coll. ; J. Braybrooks, King's Coll. ; H. T. L. Broadway, St. Thoma S. B. Bromberg, St. Mary's ; M. J. Brookes, London ; G. Brooks, St. Mary's ; N. P. Bruce, Charing Cross ; Winifred Burbury, Leeds ; J. Burdon-Cooper, B.Sc., St. Andrew Univ. Coll. ; F. J. Burke, Liverpool ; M. J. L. Burtensha and A. M. Cantor, Guy's ; L. G. Clayton, St. Thomas's ; R. Clipstein, St. Mary's ; A. J. P. Coetzee, London ; N. C. Coom Camb. and Bristol ; W. E. P. Corbett, St. Mary's ; H. Cowen, Univ. Coll. ; Doris Critchley, Royal Free ; L. M. Crook Liverpool ; J. E. Davenport, London ; D. Davidson, Univ. Coll. ; T. A. L. Davies, St. Thomas's ; S. C. De, Middlesex ; R. J. de Carteret, Birmingham ; G. A. Dickson, Sheffield ; A. E. Dudley, King's Coll. ; G. G. M. Edelsten, St. Bart.'s ; H. Edwards, Guy's ; G. R. Ellis, Liverpool ; A. G. Evan Birmingham ; C. D. Evans, St. Mary's ; Jennie G. Eva Westminster ; L. S. Everett, King's Coll. ; G. G. Exne L.D.S. Eng., Guy's ; J. Fishman, London ; J. F. P. Forst Birmingham ; F. W. A. Fosbery, Bristol ; J. W. H. Fo Liverpool ; A. C. Gladstone, St. Thomas's ; F. R. Glov London ; P. W. Godfrey, Leeds ; D. C. Green, St. Thomas H. N. Gregg, Birmingham ; M. Hafezi, St. Mary's ; Winifred S. Hall, Univ. Coll. ; H. A. R. Hamilton, W. P. Hedgcock, and E. A. Hoare, St. Thomas's ; E. K. Hole, St. Bart.'s ; A. Hollingworth, St. Thomas's ; J. Howell, Guy's ; J. H. Hughes and T. L. Hughes, Liverpool ; Daisy G. Iliff, King's Coll. ; J. M. Jackson St. Bart.'s ; L. S. Jaikaran, London ; J. A. James, Charin Cross ; W. P. Jenson, Westminster ; D. Johnson, King's Coll. P. W. E. Jones, St. Bart.'s ; T. B. Jones, Westminster ; T. J. Jones, Univ. Coll. ; Alice M. Kaye, King's Coll. ; R. L. Kenned St. Bart.'s St. Mary's ; B. S. Lange, Guy's ; A. W. Langford, St. Bart.'s N. Langdon-Down, London ; H. H. Langston, St. Thomas's R. E. Lauder, Charing Cross ; W. S. G. Lawson, S. B. Levy R. A. Q. Lay, Guy's ; E. S. Lee, Westminster ; T. M. A. Lewis, London Liverpool ; A. A. Lewis, Guy's ; H. F. Loewenthal, Liverpool L. H. B. Light, St. Thomas's ; R. A. Mac P. H. Lomax, Guy's ; K. Malik, L.D.S., London ; Oonah L. Matthews clark, Middlesex ; M. H. Masina, St. Bart.'s ; Guy's ; J. W. Univ. Coll. ; M. T. Maung, N.B., Rangoon, M. A. N. Moezuddin Meanley, Leeds ; S. G. Meanley, Leeds ; W. J. Morris St. Thomas's ; I. D. Monger, Charing Cross ; P. H. Mankiell Liverpool ; Irene P. Murray, King's Coll. ; A. H. Osmond, Birming Middlesex ; K. H. Nassif, Royal Free ; A. L. Potter, Liverpool ham ; Norah W. K. Petter, Royal Free ; P. Pringle, King's Coll. S. Prakash, M.B., Charing Cross ; Univ. Coll. ; P. G. D. F. Robb, St. Thomas's ; B. Roberts, St. Thomas's ; R. D. Roberts, St. Bart.'s ; I. C. Robertson, Irene P. Rowlands Roper, St. Bart.'s ; H. Rosenberg, Guy's ; E. S. StJohn Charing Cross ; E. Rudkin, Birmingham ; W. E. Schurr Guy's ; O. A. Savage, St. Bart.'s ; Marie M. H. Sherwell Castricum, Royal Free ; C. K. Shain, Leeds ; R. E. H. Simpson Birmingham ; R. F. Simkin, St. Mary's ; N. W. Sirolells St. Thomas's ; H. M. Singer, King's Coll. ; R. E. G. Smith St. Bart.'s ; R. H. Smith, St. Thomas's ; D. J. Swamy Birmingham ; V. Swaminathan, Manchester ; J. C. S. Thomas Durham ; J. W. C. Symonds, St. Bart.'s ; R. C. Wakh St. Bart.'s ; J. R. Thornton, St. Thomas's ; Lillian I. Walker, Leeds St. Bart.'s ; G. Walker, London ; Leeds ; F. C. H Clara M. Warren, Royal Free ; H. Waterman, C. E. R. Wood White, St. Bart.'s ; J. L. Wightman, Leeds ; Guy's ; and J. Zeitlin, London.

University of Liverpool.

The title of professor emeritus has been conferred on Dr. Edward William Hope, formerly professor of public health in the University and medical officer of health for the city and port of Liverpool.

University of Manchester.

The University Court has resolved to grant the honorary degree of master of science to Dr. Alexander Brown Ritchie, for over 20 years school medical officer of the city of Manchester.

University of London.

At a meeting of the Senate on May 20th Dr. E. L. Kennaway was appointed to the University chair in experimental pathology (tenable at the Cancer Hospital (Free)). Dr. Kennaway has been chemical pathologist at the hospital since 1921. The title of professor of pathological chemistry was conferred on Mr. C. R. Harington, Ph.D., F.R.S., in respect of the post held by him at University College Hospital Medical School. The title of emeritus professor of experimental pathology was conferred on Sir Charles Martin, M.B., F.R.S., and that of emeritus professor of biochemistry on Mr. Arthur Harden, D.Sc., F.R.S., on their retirement from the Lister Institute of Preventive Medicine.

The Dunn exhibitions in anatomy and physiology for 1931 were awarded respectively to E. W. Bintcliffe, of St. Bartholomew's Hospital Medical College, and S. O. Aylett, of King's College.

Convocation has reappointed Sir Ernest Graham-Little, M.D., M.P., as a member of the Senate.

University of Leeds.

When the centenary of the School of Medicine is celebrated on July 1st the honorary degree of Doctor of Science will be conferred on Sir Walter Fletcher, F.R.S., secretary of the Medical Research Council, and on Sir Gowland Hopkins, F.R.S., professor of biochemistry in the University of Cambridge. The honorary degree of Doctor of Laws will be conferred on Dr. Alfred George Barrs, emeritus professor of clinical medicine in the university; Sir John Bland-Sutton, formerly President of the Royal College of Surgeons of England; Lord Dawson of Penn, President of the Royal College of Physicians of London; Dr. Arthur Hawkyard, Lord Mayor of Leeds; Sir George Newman, chief medical officer to the Ministry of Health and the Board of Education; and Dr. Jane Walker, medical superintendent of the East Anglian Sanatorium, Nayland.

Papworth Village Settlement.

Mr. Greenwood, the Minister of Health, last week laid the foundation-stone of a new hospital for women at the Papworth Village Settlement for Sufferers from Tuberculosis.

Research Defence Society.

The annual general meeting of this society will be held at the house of the Medical Society of London, 11, Chandos-street, Cavendish-square, W., on June 10th, at 3.30 o'clock, when the Stephen Paget memorial lecture will be delivered by Dr. H. H. Dale, director of the National Institute for Medical Research, on the Effect of Research on Curative Medicine. Lord Lamington, the President, will take the chair.

Charing Cross Hospital Medical School.

In view of the success of the recent Sunday post-graduate course, it has been decided to hold another during the next two months. It begins on May 31st with a lecture at 10.45 A.M. by Dr. W. J. Adie on Sudden Attacks of Nervous Origin, and one at 11.45 by Mr. Peter Daniel on Diseases of the Colon. Particulars will be found each week in our Medical Diary. Application for membership of *the* course should be made to the secretary of the school, 62, Chandos-street, W.C. 2.

Royal Institute of Public Health.

At the inaugural meeting of the congress of the Royal Institute of Public Health, held in the University of Frankfurt a. Main on Tuesday, May 19th, the Harben gold medal of the institute was presented to Prof. William Henry Welch, of Baltimore, in recognition of his eminent services to the public health. At the same meeting the rector of the University presented to Sir William Smith, the principal of the institute, the Ehrlich-Weigert medal of the Medical Faculty. On the following day the Oberbürgermeister, on behalf of the city of Frankfurt, presented to the institute the medal of honour of the city "in remembrance of the congress, which was the first to be held on German soil for 19 years," and handed the medal to Sir Thomas Oliver, the distinguished representative of the institute.

Belgrave Hospital for Children.

Last year 2210 in-patients were admitted; they cost £3 3*s.* 7*d.* per head. Ninety-five per cent. of them came from South London. As soon as means are available the overcrowded out-patients' department is to be rebuilt. A ward of 12 beds is now available for the children of parents of moderate means, at a fee of £3 3*s.* per week; the medical staffs' fees are fixed in accordance with the circumstances of the parents. What is claimed to be a new departure in hospital practice has come into operation recently. Arrangements have been made with practitioners in the neighbourhood whereby consultations with members of the staff may be arranged at reduced rates for parents who cannot afford the ordinary consultants' fee. These consultations are available only on the recommendations of the practitioner.

Lord Mayor Treloar Cripples Hospital and College.

On Founders' Day, Monday next, June 1st, Admiral Sir Roger Keyes will open the Portsmouth block of the hospital, and Lord Burnham will preside at the function.

Royal London Ophthalmic Hospital.

Last year there was a surplus of income over expenditure of £1798. Towards the second portion of the reconstruction scheme, which will cost £40,000, there is now available £13,500. There is a daily average of 478 out-patients.

St. Bartholomew's Hospital, Rochester.

Last year there were 1935 in-patients and 9201 new out-patients. Each in-patient costs £8 5*s.* 11*d.* (residence 21·9 days) and each out-patient 6*s.* 8*d.* The first year's working of the Association of Friends (contributory scheme) produced £4000, of which £3000 was entirely new money.

King's College Hospital.

The annual festival dinner, over which Lord Burnham presided, took place at Merchant Taylors' Hall last week when £6000 was raised. It was stated that the hospital is 200 beds behind the needs of the population served, and that in 1930 expenditure exceeded income by £13,500. Nearly half the income was provided by patients' payments. An appeal is being made for £27,000 to facilitate the provision of larger accommodation for private patients.

Royal Free Hospital.

The annual report states that by the end of 1930 the Eastman Dental Clinic had been completed and was in working order, and the venereal diseases clinic rehoused, while the Albert Levy wing was well advanced. The completion of the nurses' home is to be proceeded with as soon as possible. The year ended with a deficit of £5457, and "the General Fund is now insolvent to the extent of £25,517."

Composition and Description of Food.

The Minister of Health and the Secretary of State for Scotland have appointed a committee to inquire into the working of the law as to the composition and description of articles of food other than milk, and to report what alterations, if any, in the law or its administration appear to be desirable. Sir Frederick Willis, is the chairman and the members include Dr. J. M. Hamill. The secretary is Mr. W. J. Peete, of the Ministry of Health, to whom communications may be addressed.

King Edward VII. Hospital, Windsor.

Two wards have been added to this hospital, and during 1930 a third theatre was provided at the cost of Sir Joseph Skevington and his brother, Major Skevington. The pathological department has been removed to more convenient quarters, and the old department has been converted into a chapel which was last week dedicated by the Bishop of Buckingham. The contributory scheme last year produced £9646, an increase of more than £1000.

Bolingbroke Hospital: Proposed Extension.

In the annual report the governors call attention to the dilapidated condition of the old mansion portion of the building at Wandsworth which is "almost impossible" to remedy. They are therefore contemplating an extension which, in addition to providing further beds for patients, will not only replace the accommodation of the old building, but will enable it to be demolished to make room for additional wards. Last year there were 2458 new in-patients who stayed an average of 16·2 days, as against 15·8 days in 1929.

University College Hospital.

Last year there were 8898 in-patients (540 beds) and 81,895 out-patients. The average stay of each in-patient was 20·39 days; the cost per occupied bed was £181, and each out-patient cost 5*s.* 3*d.* A speech clinic has been instituted which deals with stammering and other speech defects, and it has been decided to establish a department of clinical research under the charge of Sir Thomas Lewis. Eight private wards have been provided in the Royal Ear Hospital, and the general committee have in mind the establishment, when circumstances permit, of a private hospital of 100 beds on a site in the immediate neighbourhood. The income last year was £107,448 and the expenditure £106,537.

Kent County Ophthalmic and Aural Hospital.

As the result of the recent extensions in-patients increased last year by 550, and the out-patients numbered 33,741, of whom 21,642 were ophthalmic cases. In addition there were 5765 ophthalmic and 2281 aural casualties. Candidates for various treatments brought up the total number of out-patients to 41,637, an increase of nearly 10,000 over 1929. Owing to the cost of alterations and improvements, and the addition of 33 beds, the hospital has a debt of £20,000. Last year the contributory fund provided over £13,000.

Donations and Bequests.

Among other bequests the late Sir Harold J. Reckitt left £5000 to the Hull Royal Infirmary; £2000 to the Hull and East Riding Convalescent Home; £1000 to the Victoria Children's Hospital, Hull; £800 to the Royal County Hospital, Chichester; £600 to the Hull Dispensary, and £200 to the Emsworth (Hants) Cottage Hospital.

New Infirmary at Chard.

A new infirmary has been added to the Chard Public Assistance Institution. It has cost £10,000, is a two-storey building of concrete, and has 48 beds. The nursing staff are placed in an adjoining bungalow.

Royal Eye Hospital.

It is proposed to rebuild this hospital, at St. George's-circus, Southwark, at an estimated cost of £150,000. The beds would be increased from 46 to 80, and more private wards would be provided, together with larger space for research work and out-patients.

Lyndhurst Maternity Block.

Miss Fenwick, president of the Fenwick Cottage Hospital, Lyndhurst, has presented the institution with a completely equipped maternity block formed by the conversion of some cottages close to the main building. There are two three-bed wards.

St. George's Hospital.

At the annual court of governors last week Prince George, the President, stated that the income last year was £87,388, and the expenditure £83,825. There were 5000 in-patients and 4000 operations. Lord Greville, the treasurer, said that the hospital is faced with the prospect of making an appeal for a large sum either for an entirely new building or for complete reconstruction of the old one.

Hospital Surpluses.

Last year the Queen's Hospital for Children, Hackney-road, had a credit balance, the first for 20 years, of £1408, as compared with a deficit of £1618 in 1929.—St. Helen's Hospital had a surplus of £1019 and St. John's Hospital for Diseases of the Skin, £1111.

Victoria Hospital for Children.

The average daily number of in-patients in 1930 was a fraction over 105, as compared with 94 in 1929, and their average weekly cost fell from £3 9*s.* 9*d.* to £3 7*s.* 6½*d.* The cost of maintaining the hospital and the convalescent home at Broadstairs was £26,386; the income was £24,251. During 1930 the ladies' association granted £715 to the hospital.

Enlargement of Bolton Infirmary.

The first extensions of this institution since it was built 50 years ago, consisting of the Nathan Barnes and Colin Cooper wards, were recently formally opened by Mrs. Colin Cooper, widow of one of the donors, and Miss Barnes, sister of the other donor. Each ward has cost £10,000.

Bath Orthopædic Hospital.

A new ward for 20 babies was recently opened by Mrs. Stanley Wills at the Bath and Wessex Children's Orthopædic Hospital. The addition, which is due to the generosity of her son, Mr. R. D. Wills, brings up the accommodation to 92 beds. Of the £30,000 required to complete a scheme for a further 50 beds, £18,250 has already been raised.

Royal Salop Infirmary.

Since the Road Traffic Act came into force and insurance of motorists became obligatory this institution has recovered between 60 and 70 per cent. of the cost of treating patients injured in motor accidents. The expenditure last year was £20,658, leaving a deficit of £2778. Among the receipts the two historic annual fixtures, the anniversary service and the infirmary ball, produced between them over £2200.

Paybody Convalescent Home.

A new ward which has been added to the Paybody convalescent home of the Coventry and district crippled children's guild at Allesley, near Coventry, was opened recently by Sir Edward Iliffe. The ward, which has cost about £5000, provides accommodation for 20 boys and 20 girls. There are between 1100 and 1200 children on the books of the guild.

Metropolitan District Nursing Association.

At the annual meeting last week it was stated that last year the nurses from the Bloomsbury home paid more than 57,000 visits, and that the work of the St. Pancras home had been so heavy that, notwithstanding the addition of another nurse, continuous help had to be given by the main home. There is a deficit of £1000 upon the St. Pancras branch.

Medical Diary

Information to be included in this column should reach u in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
FRIDAY, June 5th.—9.30 A.M., LARYNGOLOGY. Summ Meeting. Papers and Demonstrations:—Dr. A. Br Kelly and Prof. Leonard Findlay: Congenital Shorte ing of the Œsophagus, and the Thoracic Stoma Resulting Therefrom. Dr. H. Graham Hodgson: T Radiography of Sinusitis (with Film). Prof. Geor Portmann (Bordeaux): Treatment of Cicatric Stenosis of the Œsophagus by Auto-dilatation. Sir StClair Thomson: A Permanent Tracheostomy Stenosis of the Larynx. 5 P.M., Clinical (Cases at 4 P.M.). Demonstration of Instruments. Mr. O. O. Popper: Broncho-œsophagoscope. C and specimens will be shown by Mr. W. Ibbots Mr. Walter Howarth, Mr. V. E. Negus, Mr. W. H. Jewell, Dr. T. A. Clarke, Dr. C. F. Beevor, Mr. Herbert Tilley, and Sir James Dundas-Grant.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.
FRIDAY, June 5th.—8.15 P.M. (at the Kensington T Hall), Prof. Julian Huxley: Development in Relatio to Heredity and Evolution, illustrated by slides (Cavendish Lecture).

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.
THURSDAY, June 4th.—5 P.M., Prof. M. J. Stewart: P cancerous Lesions of the Alimentary Tract (T Croonian Lecture).

WEST LONDON HOSPITAL POST-GRADUATE COLLEG Hammersmith, W.
MONDAY, June 1st.—10 A.M., Gynæcological Ward Vi Genito-Urinary Operations, Skin Department. 11 A.M. Surgical Ward Visit. 2 P.M., Surgical Ward Vi Medical, Surgical, Eye, Gynæcological Out-patients.
TUESDAY.—9.30 A.M., Operations. 10 A.M., Medical W Visit, Dental Department. 11 A.M., Throat Operatio 11.30 A.M., Surgical Clinical Demonstrations. 2 P. Medical, Surgical, Throat Out-patients, Operatio Medical Ward Visit.
WEDNESDAY.—10 A.M., Medical Ward Visit, Childre Medical Out-patients. 2 P.M., Medical, Surgical, a Eye Out-patients, Gynæcological Operations. 4.45 P.M. Venereal Diseases.
THURSDAY.—10 A.M., Neurological Department. 11.30 A.M. Treatment of Fractures. 2 P.M., Medical, Surgic and Eye Out-patients, Genito-Urinary Departme Operations.
FRIDAY.—10 A.M., Medical Ward Visit, Skin and Dental Departments. 12 noon, Medical Lecture. 2 P.M., Medical, Surgical, and Throat Out-patients. Opera-tions.
SATURDAY.—9 A.M., Throat Operations. 10 A.M., Medic Ward Visit, Surgical and Children's Medical Out-patients.

NATIONAL HOSPITAL, Queen-square, W.C.
MONDAY, June 1st.—12 noon, Dr. Greenfield: Th Cerebro-spinal Fluid. 2 P.M., Dr. Riddoch: Ou patient Clinic. 3.30 P.M., Dr. Hinds Howell: Sciati Neuritis.
TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic.
WEDNESDAY.—2 P.M., Dr. Martin: Out-patient Clinic.
THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patie Clinic. 3.30 P.M., Dr. Walshe: Cerebral Tumours (I
FRIDAY.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M. Dr. Carmichael: Palsies Associated with Pregnan and Parturition.

LONDON SCHOOL OF HYGIENE AND TROPICA MEDICINE, Keppel-street, Gower-street, W.C.
MONDAY, June 1st.—5 P.M., Dr. F. C. Shrubsall: Menta Deficiency from the Social, Legal, and Educationa Aspects.
TUESDAY and THURSDAY.—5 P.M., Dr. C. J. Thomas Physically Defective Children.
FRIDAY.—5 P.M., Mr. R. R. Hyde: Industrial Welfare.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIA-TION, St. James' Hospital, Ouseley-road, Balham, S.W.
WEDNESDAY, June 3rd.—Visit to Malted Milk Co., Ltd. Slough, Bucks.

INSTITUTE OF PATHOLOGY AND RESEARCH, St. Mary's Hospital, W.
TUESDAY, June 2nd.—5 P.M., Dr. André Gratia: The Shwartzman Phenomenon.

CITY OF LONDON MATERNITY HOSPITAL, City-road, S.E.
THURSDAY, June 4th.—5 P.M., Mr. W. McKim McCullagh Causes of Maternal Mortality.

CHARING CROSS HOSPITAL MEDICAL SCHOOL POST-GRADUATE COURSE.
SUNDAY, May 31st.—10.45 A.M., Dr. W. J. Adie: Sudden Attacks of Nervous Origin. 11.45 A.M., Mr. Pete Daniel: Diseases of the Colon.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, June 5th.—4 P.M., Mr. Lowndes Yates: The Recognition and Treatment of Early Carcinoma of the Throat and Nose.

ADWICK PUBLIC LECTURES.
THURSDAY, June 4th.—5 P.M. (at the Chelsea Physic Garden), Mr. T. F. Chipp, D.Sc.: Trees and Man.

OYAL NORTHERN HOSPITAL, Holloway-road, N.
TUESDAY, June 2nd.—3.15 P.M., Dr. P. O. Ellison and Dr. Janet Vaughan: Demonstration in the Pathological Department.

NIVERSITY OF BIRMINGHAM.
TUESDAY, June 2nd.—3.30 P.M. (at the General Hospital). Mr. H. H. Sampson: Clinical Surgical Cases.
THURSDAY.—4 P.M., Prof. Blair Bell: Maternal Disablement (Last Ingleby Lecture).
FRIDAY (at the Queen's Hospital).—3.30 P.M., Prof. Billington: Demonstration of Surgical Cases.

Appointments

DMAN, G. E., M.B., B.S. Lond., has been appointed Honorary Assistant Physician to the Derbyshire Royal Infirmary.

rtifying Surgeons under the Factory and Workshop Acts: BROMS, D., M.B., Ch.B. Edin. (New Galloway District, Kirkcudbright); MURRAY, A. R., M.B., Ch.B. Edin., Poulton-le-Fylde, Lancaster.

Vacancies

For further information refer to the advertisement columns.

rrington Victoria Hospital.—Hon. Anæsthetist. Also H.S. £150.
ert Dock Hospital, Connaught-road, E.—Dental Surgeon.
fast, Campbell College.—Res. M.O.
rmingham Ear and Throat Hospital, Edmund-street.—H.S. At rate of £150.
mingham General Hospital.—Res. Surg. Reg. £100–£120–£140. Two Res. Anæsthetists. Each £120. Also Res. H.S. £70.
mingham, Highbury Hospital, Moseley.—Res. Asst. M.O. £300.
rmingham, P.H. Dept.—Asst. M.O. for Tuberculosis Section. £400.
ckburn Royal Infirmary.—4th H.S. £150.
ry County Borough.—Asst. M.O.H., &c. £500.
ncer Hospital, Fulham-road, S.W.—H.S. At rate of £100.
nterbury, Kent and Canterbury Hospital.—H.P. and H.S. Each at rate of £125.
rdiff, King Edward VII. Welsh National Memorial Assn.—Area Asst. Tuber. Physician. £600.
rdiff, Llandough Hospital.—Med. Supt. £750.
rlisle County Borough.—Asst. M.O.H. £650.
ntral London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C.—Hon. Assts. to Out-patients' Dept.
esterfield and North Derbyshire Royal Hospital.—Cas. O. At rate of £200.
ty of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.
nnaught Hospital, Walthamstow, E.—Res. H.P. At rate of £100.
ventry and Warwickshire Hospital.—Res. H.S. £125.
rby, Derbyshire Hospital for Sick Children.—Res. H.S. and Res. H.P. At rate of £150 and £130 respectively.
rby, Derbyshire Royal Infirmary.—Ophth. H.S. £150.
ncaster Royal Infirmary.—H.S. At rate of £175.
rham, County Council.—District Tuber. M.O. £500.
rham County Council and Chester-le-Street U.D.C.—District Tuber. M.O. and M.O.H. £800.
st London Hospital for Children and Dispensary for Women, Shadwell, E.—Res. Cas. O. £125.
sex Administrative County.—Asst. County M.O.H. £500–£600.
eter, Royal Devon and Exeter Hospital.—Res. Sen. H.S. £250. Also Res. H.S. and H.S. to Spec. Depts. Each at rate of £150.
ucester, Gloucestershire Royal Infirmary, &c.—H.S. At rate of £120.
mmersmith Hospital, Ducane-road, Shepherd's Bush, W.—Res. Med. Supt. £950.
ospital for Sick Children, Great Ormond-street, W.C.—H.S. and H.P. Each at rate of £100.
ford, King George Hospital.—H.S. At rate of £100.
dderminster and District General Hospital.—H.S. £150.
ng's Lynn, West Norfolk and King's Lynn Hospital.—Jun. H.S. At rate of £125.
ncaster Royal Infirmary.—Jun. H.S. £130.
eeds Hospital for Women.—H.S. At rate of £50.
eicester Royal Infirmary.—H.P. At rate of £125.
ondon, Female Lock Hospital, 283, Harrow-road, W.—H.S. At rate of £150.
ondon Temperance Hospital, Hampstead-road, N.W.—Cas. O. and H.P. At rate of £120 and £100 respectively.
acclesfield, Cheshire County Mental Hospital, Parkside.—Asst. M.O. £350.
Manchester Babies' Hospital, Burnage-lane, Levenshulme.—Sen. and Jun. Res. M.O.'s. At rate of £125 and £50 respectively.
Manchester and District Radium Institute.—Asst. M.O. At rate of £300–£500.
Manchester Ear Hospital, Grosvenor-square, All Saints'.—H.S. £150.
Manchester, Royal Children's Hospital.—Sen. M.O. for Out-patients' Dept. £300.
Manchester Royal Infirmary.—H.S. for Central Branch, Roby-street. At rate of £100.
Manchester, Withington Hospital.—Two Asst. M.O.'s. Each at rate of £275.
Miller General Hospital, Greenwich-road, S.E.—H.P., H.S. Each at rate of £125. Also Out-Patient Officer. At rate of £150.
National Hospital for Diseases of the Nervous System, Queen-square, W.C.—Hon. Asst. Radiologist.
Newcastle-upon-Tyne, Hospital for Sick Children.—H.S. At rate of £100.
Nottingham General Hospital.—Cas. O. At rate of £200.
Oldham Royal Infirmary.—H.P. and Cas. O. Each at rate of £175.
Plymouth, Central Hospital.—H.S. At rate of £140.
Princess Louise Kensington Hospital for Children, St. Quintin-avenue, North Kensington, W.—H.S. At rate of £100.
Queen Mary's Hospital for the East End, E.—Hon. Asst. Obstet. Surgeon and Gynæcologist. Hon. Neurologist. Res. M.O. and Cas. O. At rate of £200 and £150 respectively. Also H.P.'s and H.S.'s. At rate of £120.
Reading, Royal Berkshire Hospital.—Res. Anæsthetist. At rate of £150.
Rotherham Hospital.—Cas. H.S. £150. Also Sen. H.S. £200.
Royal Free Hospital, Gray's Inn-road, W.C.—Res. H.P.'s and H.S.'s to Special Depts. Unit Anæsthetist and District Obstet. Asst. £100. Also Cas. O. £150.
Royal Free Hospital, Eastman Dental Clinic, Gray's Inn-road, W.C. Res. H.S.
Salford Royal Hospital.—H.P. and H.S. Each at rate of £125.
Sheffield Children's Hospital.—H.P. and Third Res. M.O. At rate of £100 and £80 respectively.
Sheffield, Jessop Hospital for Women.—Three Asst. H.S.'s. Each at rate of £100.
Southampton County Borough.—M.O.H. &c. £1250.
Southampton, Royal South Hants and Southampton Hospital.—Res. H.P. and 2 H.S.'s. All at rate of £180.
Stoke-on-Trent, Longton Hospital.—H.S. £120.
Walsall, County Borough.—Asst. Tuber. O., &c. £750.
Walsall General Hospital.—H.S. At rate of £150.
West Bromwich, Great Barr Children's Homes &c.—Asst. Res. M.O. £275.
West Bromwich, Hallam Hospital.—Res. H.S. £250.
West London Hospital, Hammersmith-road, W.—H.P. and two H.S.'s. All at rate of £100.
Westminster Hospital Annexe, 66, Fitzjohn's-avenue, Hampstead.—M.O. At rate of £300.
Windermere, Ethel Hedley Orthopædic Hospital for Crippled Children.—Res. H.S. £150.
Windsor, King Edward VII. Hospital.—Two H.S.'s. Each at rate of £100.
Wolverhampton, Royal Hospital.—H.S. At rate of £100.
York County Hospital.—H.S. Also Res. Anæsthetist and Asst. H.S. Each £150.
York, The Retreat.—Sen. Asst. M.O. £400–£500.

The Chief Inspector of Factories, Home Office, S.W., announces a vacancy for a Certifying Factory Surgeon at Grosmont (Yorks, N. Riding).

Births, Marriages, and Deaths

BIRTHS.

BARKER.—On May 20th, at Jesmond, the wife of Valentine Holland Barker, M.R.C.S., L.R.C.P., of a son.

PARKER.—On May 20th, at Sandgate, Kent, the wife of Dr. F. Gerald Parker, of a daughter.

WILSON.—On May 22nd, at Cedar House, Radlett, Herts, the wife of Dr. A. G. Wilson, of a daughter.

MARRIAGES.

RICHARDSON—LEA.—On May 20th, at Marylebone, Gilbert Richardson, M.A., M.D., of Manor House, N.W., to Hilda, daughter of the late C. A. Lea and of Mrs. Lea, of Elsworthy-terrace, South Hampstead, N.W.

DEATHS.

GOOD.—On May 21st, on board s.s. *Carina*, Arnold Saxty Good, M.R.C.S., L.R.C.P., of High Bickington, N. Devon.

HALLIBURTON.—On May 21st, at a nursing home in Exeter after an operation, William Dobinson Halliburton, M.D., F.R.S., Emeritus Professor of Physiology, King's College, London.

MORTON.—On Whit Sunday, suddenly, at Gillingwood, Ulundi-road, Blackheath, S.E., John Edmondson Morton, M.R.C.S., L.R.C.P.

TAYLOR.—On May 20th, 1931, at 21, Wembley Park-drive, Seymour Taylor, M.D., F.R.C.P., late of Seymour-street, W. 1, and St. Thomas's Hospital, in his 80th year.

WATERHOUSE.—On May 23rd, at Wimpole-street, W Sir Herbert F. Waterhouse, M.D., F.R.C.S., aged 67.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

EAST HAM MEMORIAL HOSPITAL.—In 1930 this hospital, which has now received full recognition as a training school for nurses, admitted 1481 patients, an increase of 079, and the 6140 new out-patients made 23,259 attendances. In-patients costs £3 12*s.* 7*d.* per week, a fall on the previous year of 8*s.* 9*d.*; out-patients cost about 5*s.* 4½*d.* each. The total deficit at the end of the year was £15,922.

NOTES, COMMENTS, AND ABSTRACTS

THE COAL-MINER.

TWO Chadwick public lectures on the Coal-miner, His Health and Occupational Diseases, were given in London by Prof. E. L. Collis on May 15th and 18th. Describing a visit to a mine, he said that the light given by safety lamps, which had to be used in most coal pits, was less than that given by the candles which, of old, miners placed in their caps, and so brought fairly close up to the coal upon which they worked with the pick. The illumination to-day was so dim that the eyes of miners became affected; they could not be held steady, but oscillated involuntarily. These eye movements occurred in many miners, of whom a few were troubled with distressing eye movements and incapacitated from work. Miners' nystagmus topped all other occupational diseases added together for which workmen's compensation was paid; it was estimated to cost the mining industry about £1,000,000 a year.

The number of claims for compensation among coal-miners was very high. Thus in 1929 23 per cent. of miners employed claimed compensation, as against 12 per cent. of dockers, 4 per cent. of railway men, and 3·8 per cent. of factory operatives. For diseases alone, out of a total of 10,518 cases, including all forms of industrial disease for which first payments were made during 1929, the miner claimed 8500; and out of 8143 cases continued from previous years, he was responsible for 7629. Yet, out of the total number of 7,450,112 persons employed under the terms of the Compensation Acts, the miner only claimed 930,780. After nystagmus the next most frequent disease was beat-knee, with 3406 new cases and 175 old; followed by beat-hand with 1708 new cases and 134 old. There were also claims for 458 new cases and 35 old of beat-elbow, and 316 new and 13 old cases of inflamed wrist. All these conditions were due to the way in which the miner used, or rather misused, his body while at work, and they were very different from miners' nystagmus, with its all-important psychological factor. In each, however, treatment had to aim not only at healing, but at completely restoring function. The most serious cause of accidents among miners was falls of roof, due largely to careless timbering while at work. Every colliery was called upon to provide facilities whereby such injured men could be removed to the nearest hospital. The mortality-rates experienced by coal-miners from various diseases, and from accidents, showed interesting differences on different coal-fields, and it had been observed that miners tended to be most dissatisfied with their working conditions on those coal-fields where the mortalities were highest.

In his second lecture Prof. Collis described the miners' welfare fund. This began, he said, in 1920 and depended upon a levy of 1*d.* on every ton of coal raised, which brought in about £1,000,000 a year. Since 1926 the fund had been augmented by a levy on royalties, in order that pit-head baths might be provided throughout the coal-fields. Baths of special construction were now springing up over the coal-fields, and were an advance on anything to be found abroad. They should go far to reduce the incidence of beat-knee, beat-hand, and beat-elbow, and boils in the hot mines, and should help to reduce muscular rheumatism, the great enemy of the miner.

Apart from pit-head baths four-fifths of the money from the fund was spent on the coal-field from which the levy came, and the remaining fifth was used by a central committee for purposes beneficial to the whole mining community, such as research into safety and health. A board of experts had been brought into existence, with an income of rather over £50,000 per annum, and this board carried out investigations for preventing explosions. They studied safety appliances and means for improving mechanical conditions below ground, as well as furthering research into conditions of health.

INFECTION FROM MESS UTENSILS.

MANY years ago[1] Col. C. Lynch and Lt.-Col. J. G Cumming, of the U.S. Army Medical Corps, co tended that infection from sputum-borne disea in the army was spread by dirty utensils rath than the barrack-room air, and urged the boiling mess-gear. Dr. Cumming returns to this meth in a further paper (*Military Surgeon*, reprinted i the *Jour. R.A.M.C.*, for February). To quote o of his evidences: of 21,411 civilians studied, 17,2 had their mess-gear washed at 91° C. by machine, an 20 per 1000 got influenza, while there were 103 ca per 1000 among the 4175 whose mess-gear was washe by hand at 44° C. Machine washing at 91° (195° F.) similarly reduced infection from diphtheri mumps, measles, and pneumonia.

A NEW TYPE OF LIGHT-SOURCE.

A BOOK entitled Artificial Sunlight[2] has an ope ing paragraph in the following style: "Nature beneficent—life giving—but also ruthlessly destr tive. Its eternal shower of blessings has not effac or even dimmed the edict that only the fit sh survive." When an author starts thus and contin in more or less the same strain for nearly 30 pag the reader is hardly prepared to find the caref compiled mass of data bearing upon the measurem reflection, scattering and absorption of infra-r visible and ultra-violet radiations which follows th rhetoric. The data, which are drawn from a numb of reliable sources, should be of the greatest value readers concerned in many forms of quantitati work. The final chapters are on Electric Arcs the Utilisation of Artificial Sunlight. The front piece of the book is an illustration of a new type light-source and consists of a mercury arc betw tungsten electrodes with a tungsten filament parallel with the arc. Though the arc is enclosed a bulb, it transmits ultra-violet radiation up to t wave-length 2800 Angstrom units and would appe to have claims upon the attention of radiotherapists.

ANIMAL WELFARE.

THE first volume of an annual review of wo in the cause of animals has just appeared.[3] Th University of London Animal Welfare Society, which sponsors the book, is composed of under graduate and graduate members of the Univers of London. The volume contains a series of sig articles and reviews. Mr. F. E. Hodgson surveys th history of the Parliamentary protection of anima Prof. J. G. Wright supplies a report of the Po Persons' Clinic at the Royal Veterinary College, a note on the use of narcotics and anæsthetic Various writers describe the state of animal protecti in foreign countries, including the practice in th slaughter-houses, the use of animals in sport, amuse ment, and industry, and the state of the law and publ opinion. A symposium on present-day problems includes discussion on the cruelties of the fur trade— with a list of firms where fur fabrics made of woo can be purchased—humane slaughter, the trag of diving-birds on oil-strewn beaches, and reform needed in the trapping of rabbits. The book will be of interest to all who care for animals.

Corrigendum.—Owing to a misunderstanding for which he was in no way responsible Dr. Gilbert E. Brooke was described as P.M.O., Sarawak, at the head of an article on Abolition of Bills of Health, in our issue of March 14th (p. 606). His appointment is that of chief health officer.

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[1] See THE LANCET, 1919, ii., 158.

[2] Artificial Sunlight. By M. Luckiesh, D.Sc., Director, Lighting Research Laboratory, General Electric Company, Cleveland, O. London: Crosby Lockwood and Son. Pp. 254. 16s. 6d.

[3] The Animal Year-book. Issued by the University of London Animal Welfare Society. Edited by C. M. Knight, D.Lit., and C.W. Hume, *M.C.*, B.Sc. Univ. of Lond. Press. 1931. Pp. 173.

ADDRESSES AND ORIGINAL ARTICLES

THE NEUROLOGY OF OLD AGE.*

BY MACDONALD CRITCHLEY, M.D. BRIST.,
F.R.C.P. LOND.,
NIOR NEUROLOGIST TO KING'S COLLEGE HOSPITAL; ASSISTANT
PHYSICIAN TO THE NATIONAL HOSPITAL, QUEEN SQUARE.

LECTURE II.

Clinical Manifestations in Old Age.

In this lecture I propose to discuss the neurological mptoms and signs which are commonly encountered aged subjects. The problem at once arises whether istinction can be made between what is "normal" nd what is "pathological" in old age. At either treme the differentiation is obvious, and a contrast striking between a vigorous and active old man nd the bedridden and decrepit senile patient. The termediate stages are extremely difficult to evaluate, owever.

Létienne was bold enough to attempt a definition tween senescence or healthy old age and senility; states that in the former there are modifications the organism which must not be looked upon as sorders, while in the latter there are actual altera- ons or lesions. Therapy is impossible in the one, says, but possible in the other.

The inadequacy of this proposed definition is vious, and I believe that no useful purpose is served setting up artificial distinctions between the two ates. I propose to confine my attention to the inical manifestations in such aged individuals as e commonly seen in medical practice either in their omes or in the large special institutions.

There remains the problem of selection; which gns and symptoms shall be included in this discussion nd which omitted? Bearing in mind Hippocrates's ictum that "old persons have fewer diseases than he young, but chronic diseases never leave them" —I have decided to concentrate on the former group. propose, therefore, to omit (1) the ordinary nervous iseases of mankind which may happen to occur in ld people, and (2) the commoner cerebrovascular yndromes, such as hemiplegia, aphasia, and the like. There will remain for discussion (1) those minor lterations in neurological signs which are typical f old age, and (2) certain rare syndromes which elong more or less exclusively to the senium.

These two classes can most conveniently be escribed under various neurophysiological systems.

Sensation.

It is a common observation that in old age there may be a general diminution in the acuity of perception both as regards the special senses and also in respect of visceral and cutaneous sensation. 150 years ago Buffon wrote that in old age . . . "the head shakes, the hands tremble, the legs totter, the sensibility of all the nerves decreases, and every sense is blunted." Rolleston points out how often severe thoracic or abdominal disease exists in the aged without pain; an extensive pneumonia or peritonitis can be entirely unsuspected; gallstones and renal calculi may be passed without the ordinary colic. Dr. Earl has informed me that minor surgical operations and dental extractions can be carried out with but little pain and discomfort. The catastrophe of coronary thrombosis can take place with none of the agonising symptoms found in younger individuals.

On the other hand, subjective sensory complaints are relatively common among the aged. Thus stabbing, darting, or aching pains may be described particularly in the lower limbs. Neuralgias are common, and the intractable symptoms of tic douloureux and post-herpetic neuralgia are characteristic of old age. Dysæsthesiæ of various types are also frequent, again especially in the legs. Thus sensations of burning heat or "bursting feelings" are not rare, and at times numbness, tingling, formication, pins and needles, are described.[90] Geist referred to painful cramps in the legs provoked by movement under the term "myotalgia senilis."

Accurate objective study of the acuity of cutaneous sensibility is usually difficult, and may be impossible on account of the relative mental inaccessibility of the patient. Experience of a large series of cases, however, teaches that marked and widespread changes may occur.

The outstanding and perhaps the earliest alteration is seen in respect of vibratory sensibility. There is, with advancing years, a progressive impairment of this form of sensation, leading eventually to a total loss. This is demonstrable first at the extremities of the limbs. Thus vibratory sense may be impaired at the fingers and toes only; later it is lost at the wrists and ankles, though still present proximally.

Dr. Earl, at Tooting Bec Asylum, has found a loss of vibratory sense in 20 out of 49 consecutive patients in whom adequate coöperation was possible. In Philadelphia, Pearson [91] has examined the sensitivity of individuals of all ages to vibration, and has found that decade by decade there is a slight decrease in the sensibility over the lower extremities which becomes striking after 50 years. Many of his older patients had lost vibratory sense altogether.

It is highly probable that postural sensibility is also affected, though less frequently and to a less obvious degree. Unfortunately, the difficulties of obtaining an adequate coöperation are such as to preclude a statistical study.

Appreciation of tactile and painful stimuli is also impaired or even lost in a number of very aged individuals, though this defect is certainly less common than disorders of deep sensation. When present it is almost always found over a characteristic distribution —namely, over the hands and distal portions of the arms, and over the feet and distal portions of the legs. There is no sharp demarcation between normal and impaired sensibility, one area merging gradually into the other.

It is difficult to determine what degree of perception exists when stimuli are applied to the "normal" or proximal areas. Here again the inaccessibility raises insuperable obstacles. However, it would appear, from the common failure of emotional facial movements and gesture and the lack of protest when moderately strong stimuli are applied, that in many cases there is a relative rise in the threshold of pain sensibility, though not of cold.

This progressive impairment of common sensibility in old age is probably due to changes at all levels of the nervous system. It is likely that loss of postural and vibratory sensation can be attributed to degeneration in the long ascending tracts within the spinal cord. The common distribution of impaired touch and pain sensation suggests changes in the peripheral nerves, probably in the nature of senile or arterio-sclerotic polyneuritis (Oppenheim, Franceschi). It is possible, too, that atrophic and sclerosing alterations in the skin, subcutaneous tissue, and muscles may interfere with the sensitivity of the sensory nerve-endings. Finally, cerebral—and particularly cortical—changes may interfere with the complete and prompt recognition of proprio- and noci-ceptive impulses, resulting in a general elevation of the pain threshold, or even an indifference towards such stimuli.

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* The Goulstonian Lectures delivered before the Royal College of Physicians of London on March 10th, 12th, and 17th respectively. Lecture I. appeared on May 23rd.

VISION AND THE VISUAL APPARATUS.

Progressive impairment of visual acuity is, of course, characteristic of advancing age, if we except for a moment those cases of myopia which improve as the years pass.

Warthin,[92] indeed, describes the three cardinal signs of senescence as sexual neurasthenia, chronic fatigue, and presbyopia. Quite apart from the results of disordered elasticity of the lens, other pathological changes may appear and further interfere with vision. Thus senile atrophy of the optic nerve (v. Stief),[93] senile choroiditis, opacities within the cornea and media, retinal arterio-sclerosis, and arterio-sclerotic retinitis may contribute to the general defect of function.

Another type of visual disorder occasionally seen in aged dements has been described by Pick [94] [95] as "senile apperception." Here we have a visuo-psychical defect belonging to the category of object-agnosia. It comprises an inability to recognise the nature of surrounding objects, although the patient can see and often describe them. The article is immediately recognised as soon as some other sense channel is stimulated. For example, one of Pick's patients was unable to recognise a burning candle until it was brought so near that the flame scorched her. A lemon or an onion was unrecognised until she smelled it. In Macdonald's case [96] the patient could not recognise a match; in the author's own words . . . "the patient could describe the shape and size, criticise the odour of the fumes, show disgust at the taste of the phosphorus, repeat the word "match," spell it, tell that it was made of wood, withdraw from the heat and sight of the blaze, and yet declare that it was an unfamiliar object, that he had never seen anything like it, and, moreover, could neither describe its uses nor name it." A milder form of senile apperception comprises a difficulty in recognising the whole of an object, especially when of large size. Thus a patient may recognise his own thumb but be unable to point to his little finger; shown a portrait, he may indicate the eyes but fail to point to the ears or mouth. This defect is best described as one of visual synthesis. The anatomical basis for such agnostic disorders lies in an atrophy, usually bilateral, of the occipital cortex. Many of the best examples are found in cases of senile dementia, but also in that presenile psychosis known as Pick's circumscribed cortical atrophy.

Numerous objective changes in the ocular mechanism occur in old age. We need mention only the more strictly ophthalmological features, such as epiphora, blepharospasm, arcus senilis.

Alterations in the pupillary reactions are important. With advancing years there is a progressive sluggishness in the response of the pupils, both to light and on accommodation, and ultimately a condition of pupillary immobility may develop. At an intermediate stage the response to one form of stimulus—namely, to light—may suffer before that on accommodation, so that the Argyll Robertson phenomenon may be demonstrable. According to Möbius,[97] the react sluggishly or not at all to acoustic and stimuli.

The pupils are usually small in the elderly, wide mydriasis scarcely ever occurs unless cat is present. Möbius found high-grade miosis in 23 cent. and small pupils in 71 per cent. of his of senile patients, and he associates this phenom with the enophthalmos and narrowed palpeb fissure common in old age.

The range of the ocular movements may interesting changes; it is common, for exam for the inward movements of the eyeballs on conv ence to become impaired and ultimately to be lo Still more often one sees an absence or impairm of the conjugate movement of upward deviation the eyeballs; lateral and downward moveme rarely suffer. Nystagmus does not occur, exc when focal lesions within the cerebellum happen be present.

HEARING, TASTE, AND SMELL.

Deafness due to intercurrent disease of the midd ear is, of course, not uncommon, but even in absence of gross aural disease some degree of impair auditory acuity is frequent. This latter is cha terised by a loss of hearing for whisper and for hi tones, together with shortened bone conducti Loss of audition for low tones appears lat Berberich [98] describes an "arcus lipoides" of drumhead analogous to the arcus senilis of the corn

The faculties of taste and smell are probably l acute, for most very aged individuals are indiffer to the quality of what they eat, provided the quant is adequate. A liking for pungent or piquant s stances is suggested by the frequent excessive use condiments. The senile dement is usually witho appreciation of flavour, and may eat filth and d without disgust. The appetite, however, does suffer in the vast majority of cases. Indeed one the characteristics of the centenarian is a voracio appetite which can be satisfied only by large an frequently repeated meals.

Apart from exceptional instances, there is characteristic diminution and loss of the sex libido.

Myotrophy.

The entire musculature tends with advancing ye to undergo involutional changes which are manifest as wasting. Probably the chief cause of this chan is to be demonstrated in the general process of sen atrophy which shows itself in the muscles as elsewher Undoubtedly, however, other factors operate, an changes in the grey matter of the spinal cord, an also in the peripheral nerves, are contributory cause Lastly, in individuals who have spent much time i athletic pursuits or have been engaged in hard manu labour, the factors of disuse and enforced inactivi participate.

A progressive and extreme wasting of the muscl advancing from one segment to another, and accom panied by fibrillation and at times by signs pyramidal disease, is a rare feature in senility Oppenheim has spoken of such cases as instances subacute and chronic anterior poliomyelitis. Tw examples of this kind in patients of 66 and 67 respec tively were described before this College by Miche Clarke in 1915.

But, in addition to the general marasmus, mo focal muscular atrophies are not infrequent in old and are probably associated with localised changes in the neurax [illegible] nus in some of the forms of senile p anied by fibrillation, may be visible in the paralysed mbs. Here there is an association with degeneration nd atrophy of the corresponding anterior horn cells.

A rarer type of focal atrophy is exemplified in asting of the shoulder girdle, which may be associated ith spasticity of pyramidal type in the lower xtremities. Here a local lesion of the middle cervical ord is predictable, and has actually been demonstrated y D'Antona [99] in one case.

Without doubt, however, the commonest site for a trictly localised atrophy is in the hands, an Aran-uchenne type of atrophy, either unilateral or bilateral, eing by no means rare. Dr. Earl has demonstrated ten times in a series of 59 consecutive male patients ver the age of 80 at Tooting Bec Mental Hospital. he atrophy shows itself particularly in the thenar minence, but the hypothenar group and the interossei re also implicated. There results a claw-deformity, o which the later development of contractures and rthritis will produce more grotesque attitudes. he motor power in the hands is impaired, especially pposition of the thumb. Electrical tests may reveal typical reaction of degeneration. Sensory changes o not occur as a rule.

An accurate history is in most cases unobtainable, ut the typical story is that of a slowly progressive ffection of the hands, often preceded or accompanied y vague pains. There is no apoplectic onset to the isability in most cases. After reaching a certain tensity, the march of the disease stops and remains nchanged for an indefinite period.

Several attempts have been made to explain this senile thenar atrophy." Marie and Foix [100] des-ribed this wasting in a number of old people, some f whom were syphilitics. Post-mortem examination as obtainable in three, and a strictly localised trophy was found in the anterior horns of the eighth ervical segments of the spinal cord with cicatricial eplacement or small cavity formation. The authors roposed the title "anterior tephromalacia" for this athological picture.

Lhermitte has studied this syndrome with great are, first in conjunction with Nicolas,[101] and later ith de Massary.[102] In his second paper, he deter-nined that the maximum spinal change lay in two laces—the dorso-lateral nucleus and the intermediary orso-lateral nuclei in the sixth and seventh cervical egments.

The explanation of the occurrence of such localised hange is problematical. An abiotrophy of those articular neurones has been suggested; some uthors have stressed the phylogenetic importance f the hand movements in man with their specialisa-ion in such acts as prehension, and have emphasised the frequency with which wasting of the small muscles occurs in nervous diseases. Lhermitte rightly dislikes speculation of this type, and suggests that an anatomical peculiarity of the arterial supply to that spinal area may account for its frequent affection.

Arthritic muscular atrophies are frequent in old age, and are seen most typically in the interossei.

REFLEXES.

From routine neurological examination of a large number of old people it becomes obvious that the state of the reflexes alters, and that the same interpretation of physical signs does not apply as in younger individuals. Thus, the tendon-jerks tend to become sluggish and are frequently lost. The ankle-jerk illustrates this point especially well; with advancing years this tendon reflex becomes more and more difficult to elicit and finally disappears. So frequently does this occur, in the absence of other neurological manifestations, that one is driven to the conclusion that absence of the ankle-jerks in old age is without pathological significance. The supinator, biceps- and triceps-jerks also become sluggish, and may disappear, but not until after the loss of the ankle-jerks. Sometimes the knee-jerk behaves in the same manner, but here again it does not disappear until long after the ankle-jerk has been unobtainable.

Möbius [103]—who alone seems to have written on this subject—found the knee-jerks sluggish or absent in one-half of his senile patients. Much more rarely the tendon reflexes may be exaggerated; this change is particularly uncommon in the case of the Achilles jerk.

This "normal" progressive sluggishness in the tendon responses is independent of local change in the fibro-muscular structures, but the jerks may also disappear from various mechanical causes. Severe and long-standing cases of paraplegia in flexion lead to widespread contractures which render the tendon responses unobtainable. Similarly, changes within and around the knee- and ankle-joints frequently prevent the elicitation of the appropriate tendon-jerk.

The superficial reflexes also change in old age. Progressive difficulty in obtaining an abdominal response is, of course, well known, and indeed this change occurs at a relatively early date. The plantar response, however, usually persists as a characteristic flexor movement throughout adult life. At times, however, extension of the great toe occurs in old age in the absence of obvious disease of the pyramidal pathway.

The well-known laxity of the urinary and rectal sphincters in old age probably depends upon weakness of the musculature concerned and not in a disorder of the nervous controlling mechanism.

Extrapyramidal Manifestations.

Among the commonest of the neurological manifestations of old age are those usually labelled extrapyramidal motor disorders. Within that term are included the so-called amyostatic phenomena which, when occurring in complete form, constitute a variety of parkinsonism without tremor.

So common indeed are these minor extrapyramidal signs that we are often inclined to overlook them in the so-called normal senium. But most of those numerous little signs and manifestations, the characteristic gestures, attitude, stance, and gait of the elderly which so obviously distinguish them from the youthful, are really manifestations of an extrapyramidal order. So the actor, in assuming the rôle of an old man, actually imitates and adopts the various components of the parkinsonian symdrome.

The truth of this statement is revealed by closer analysis of the individual factors.

An attitude of general flexion is one of the characteristics of normal as well as of pathological old age. The head and neck are held craned forward, the upper limbs are bent at the elbows and wrists, while the hips and knees are flexed. In marked cases the degree of flexion may be extreme, and may recall examples of advanced paralysis agitans. When the patient lies in bed, one often sees the neck so flexed that the head is held in the air on a so-called "psychical pillow." A flexion attitude of the hands is very common, and in extreme cases—particularly when joint changes are present—the fingers may be ankylosed into a tightly clenched fist (main en poing fermée) with the terminal phalanges either hyper-extended or else pressed tightly into the palms (main de fakir).

Although we are no doubt on safe grounds in ascribing much of the flexion attitude to a defective function of the extrapyramidal motor system, we must not overlook other factors—mostly extraneural—which play a minor part. Thus senile atrophic changes in the vertebral column, and particularly in the intervertebral discs, will contribute to the bowed stance and the reduction in stature. Ankylosing affections of the ligaments and joints are often responsible for some of the fixity of the limbs in a position of partial flexion. Indeed, advanced cases of arthritis deformans and spondylose rhizomélique, resemble a parkinsonian syndrome so closely as to obscure the differential diagnosis.

Rigidity is another common symptom in old people, especially those showing gross cerebrovascular degeneration. In typical cases this "arterio-sclerotic rigidity" as Foerster[104] named it, consists in an uniform resistance to passive manipulations, more obvious in the extremities than in the trunk, in the proximal rather than the distal segments of the limbs, in the legs more than the arms (Critchley).[105] There is often a superadded hypertonus of a quasi-volitional nature due to the patient's failure to relax as soon as his limbs are under examination.

The clinical features of arterio-sclerotic rigidity are strikingly similar to those occurring in extrapyramidal disease, but one hastens to add that changes at all levels of the nervous system, as well as in some extraneural structures, add to the sum-total of rigidity. Thus mental change, small pyramidal lesions, sclerosis of the muscles, intra- and peri-articular adhesions, all contribute in impeding passive manipulations. The extrapyramidal factor is, however, the most important.

An additional feature is demonstrable in some senile and arteriopathic cases, particularly where psychical changes are present. Thus the patient may allow his limb to be retained in whatever attitude it is placed even in antigravity positions. This symptom, known as catatonia or catalepsy, usually denotes a combination of extrapyramidal motor disease with some degree of dementia.

A third characteristic motor sign of old age consists in a general poverty of movement. That is, the individual makes as few motions as possible, although he is not paralysed, and can execute any movement at command. The patient prefers not to exert himself, as if the effort were too great. This relative immobility is exemplified in the impassive facial expression; in the infrequent blinking of the eyelids; the statuesque attitude. When the elderly person wishes to look to the extreme left or right, the eyes move first, and the head, neck, and shoulders slowly follow all in one piece. The quick nervous gestures, movements of rhetoric, of expression, and emotional display are not seen, and in their stead is a certain poise or immobility. The elderly sit for long periods without changing their position, crossing their legs, fidgeting with their hands, or gazing around.

The so-called "associated" movements under which we include with Wilson, the secondary movements, synergias, movements of coöperation, and the like, are not in abeyance as some writers have insisted, but are reduced in amplitude and rate.

The final index of extrapyramidal disease is seen in the characteristic bradykinesis or slowness of movement; senile and parkinsonian patients alike move at a rate which strikes younger subjects as unduly slow. Automatic as well as volitional actions are affected, so that the passage of the fork to the mouth at meal-times, the movement of the jaws in chewing, are just as retarded as is the deliberate execution of a movement to command.

The foregoing components of [illegible] disease—namely, flexion attitude, rigidity, poverty of movement, and bradykinesis when present in some intensity—constitute a picture of parkinsonism. But it is probable that in some degree these manifestations are present in the majority of all senile patients, if we except those who show the more obvious signs of hyperkinesis or motor agitation.

Under two distinct circumstances these amyostatic signs become so marked in the elderly as to betray themselves immediately. In the first place, arterial changes may dominate the clinical picture so that the senile individual may present the characteristics of arterio-sclerotic parkinsonism. Secondly, we may be dealing with a condition described by Jakob[106] as "senile rigidity." Here symptoms of an obvious parkinsonian type follow the development of the characteristic psychical traits of senile dementia. The pathological basis of Jakob's disease comprises a widespread senile process affecting simultaneously the cortex and basal ganglia.

The relationship of true paralysis agitans with the ageing brain is a problem which stands a little aside, but will be considered later.

Hyperkinetic Manifestations.

In contrast with the usual economy of movement in senility, symptoms of a hyperkinetic nature occupy a less important position. Under diverse conditions, however, involuntary movements may occur, differing widely in nature and complexity. They range from simple repetitive movements of the order of tremor to bizarre pseudo-volitional activities in certain demented patients.

TREMOR.

Senile tremor constitutes the commonest instance of hyperkinesis, although by no means often encountered. Its occurrence in the elderly has been noted from the earliest times, by both laymen and physicians; it is, indeed, one of the traditional stamps of old age. Despite its universal recognition, however, little study has been made either of its clinical features or of its pathogenesis.

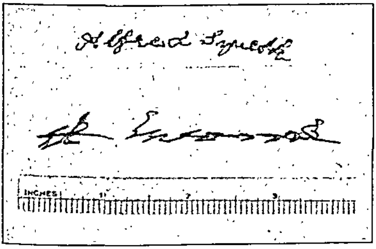
A regularly repeated alternate contraction of antagonistic muscle-groups, of small amplitude, constitutes the usual picture; there is some resemblance to the tremor of parkinsonism. Its usual rate is about 100 beats per minute. The common sites for its occurrence are the head and lower jaw, the hands, and forearms. During the waking-state the tremor may be constantly present, unless the affected segment is supported. Thus a senile tremor of the head ceases when rested against a pillow. At other times the tremor may cease spontaneously for a time, to reappear quite suddenly a moment later. The tremor is exaggerated by *fatigue* and by emotional stress; in some patients there is an apparent dependence upon the atmospheric conditions. Demange[107] refers to a patient whose tremor was inhibited by the taking of food; he was unable to commence a meal without assistance, but after taking a few mouthfuls the tremor improved so that he could finish his food alone. During sleep the tremor stops, but if the individual stirs in his sleep a tremulousness may be seen in the limbs.

The effect of volitional activity upon the tremor is variable; in the majority of cases the amplitude of the oscillations increases as soon as the limb is employed.

When the head is affected the tremor may comprise a vertical or nodding movement (*tremblement affirmatif*) or a horizontal one (*tremblement negatif*). With the involvement of the mandible there is an appearance s if the patient were constantly chewing. At times senile tremor occurs in the tongue or in the face. n the latter case there is a curious persistent grimacing, especially of the lips; one of Demange's patients was nicknamed on this account "old rabbit-face." Articulation is characteristically altered in such cases so as to produce a tremulous and punctuate type of speech.

A senile type of tremor is extremely rarely confined to the legs, and I have seen only one case in which the possibility of such a diagnosis could arise.

A man of 80 was admitted to the Hufeland Hospital, Berlin, under the care of Prof. Schuster, on account of tremor in the legs. This symptom had commenced gradually about five or six years before; it had shown itself first in the left leg, but later the opposite limb became affected, though never to the same extent. The tremor progressed slowly for a while, and then remained stationary for the last three years. Both legs are rigid, more especially the left, and the gait is spastic. When he sits down the left leg is held out in an attitude of full extension, with hyperextension of the great toe. The right knee- and ankle-jerks are barely obtainable; those of the left side are absent. Both plantar responses are of the flexor type. There is no gross abnormality in the arms or cranial nerves except for a rather lisping and imperfect articulation; no sensory changes are present. The tremor is confined to the legs, being more marked on the left side. It consists in coarse rotary movements of the whole limb, affecting mainly the thigh. The *movements* are greatly aggravated by both passive and active manipulations of the legs.



wo specimens of handwriting from patients with senile tremor. The tremulous and angular characters of the handwriting are well shown; note the absence of micrographia.

There is a striking lack of disability from the presence of senile tremor in the early stages, and even in long-standing cases the motor power is surprisingly intact. Fine manipulations of the fingers, however, soon become impaired, and the handwriting becomes grossly affected. The tremulous and irregular character of the writing resembles that seen in paralysis agitans, but differs strikingly in the absence of the characteristic micrographia.

Although senile tremor suggests at first sight the diagnosis of Parkinson's disease, the absence of rigidity, as well as gross slowness and poverty of movement, is a point of distinction. Moreover, the march of the tremor may differ in the two conditions; in paralysis agitans tremor appears in the hands before the head and jaw, whereas senile tremor may be seen first in the head and mandible, and remain localised for many years. The progression of symptoms is altogether quicker in paralysis agitans.

In a striking proportion of cases there is a family history of a similar tremor appearing in or before old age; this fact immediately suggests some association with the so-called "essential" or "hereditary" tremor which usually starts in middle age. Possibly senile tremor represents a delayed form of the idiopathic family tremor. The following cases are of interest, as suggesting that the frontier between the essential and the senile varieties is ill-defined:—

Male, aged 73, came under observation for "shaking of the hands," which had been present for about 30 years. Other members of his family were similarly afflicted; at first the tremor was but slight in degree, and it did not incommode the patient until he reached the age of 70. At this time a marked aggravation occurred, causing him to seek advice. *The appearance of the tremor differed* in no respect from that of senile tremor.

A female, aged 69, suffering from a senile tremor in the head, lips, and hands, was kindly demonstrated to me by Mlle. Gabrielle Lévy at the Hospice Paul Brousse, Paris. Symptoms had begun at the age of 50; the patient's father was also similarly afflicted since the age of 30.

A male, aged 75, had noticed shaking in the right hand for about one year. The tremor was of the typical senile variety, and there was no evidence of parkinsonism. One of the patient's brothers had had tremulous hands all his life, his present age being 71; another brother, now aged 65, had shown symptoms of paralysis agitans for 17 years. Two second cousins had also suffered from tremulous hands.

A male, aged 61, complained of tremor of the hands which had been present for five years. The characters of the movements were typical of the senile variety—despite the relatively early age of onset. An elder brother also suffered from a senile tremor, the symptoms in this case starting at the age of 70.

ATHETOSIS.

Another type of involuntary movement occasionally encountered in senility is exemplified by athetosis. Richter has directed attention to an acute form of athetosis occurring in subjects of advanced age. It is highly probable, however, that in his cases, as well as in the majority of instances, athetosis appears suddenly as the result of a gross vascular lesion; in this way athetosis appears mainly as an indication of cerebrovascular disease rather than of pure old age.

The following case exemplifies a bilateral athetosis occurring in a woman of 81—probably of arteriopathic nature:—

Female, aged 81, an inmate of an institution for some years, apparently altered physically and mentally with some suddenness five years before. She became forgetful, irritable, and restless, and was now incontinent. Both arms became "contracted" and useless. The upper limbs lie across the chest; both hands are clawed with the thumb strongly adducted across the palms. The fingers are strongly flexed, except the index fingers of both sides, which remain in a pointing position of full extension. She cannot extend her fingers voluntarily, but there is no contracture preventing passive movements. Once the fingers are straightened, slow involuntary athetoid movements appear, and gradually the hand reassumes its resting position. There is little or no defect in power in the other segments of arms, and the tendon-jerks are present. Both legs lie in an attitude of extension; there is a marked spasticity with increased reflexes and bilateral Babinski responses. Blood pressure 105; slight hardening and tortuosity of the radial arteries.

At times there occur movements of a slow "torsion" character, localised to the trunk musculature. Under the title of "the dystonic syndrome of senility," Sterling[108] has described two such cases: in the first, a woman of 69, involuntary movements gradually appeared in the abdomen and pelvis, recalling a "danse du ventre" or—as the author states—an attempt at scratching without using the hands. The term "tortipelvis" is not inapt in describing these movements. The second patient, a man of 69, developed suddenly a series of universal involuntary movements comprising tic-like contractions of the platysma; pseudo-expressive facial contortions; pseudo-spontaneous movements *of the right limbs*; choreo-athetosis of both legs, and spasmodic contractions of the tongue and left arm. In this latter case we are again probably dealing with a manifestation of vascular disease.

CHOREA.

Much attention has been directed to the occurrence of chorea as a manifestation of old age occurring independently of cerebral arteriopathy. The first case of this character was recorded in 1848 by Graves[100] of Dublin, who wrote: . . . "I think it right to mention that Dr. Ireland consulted me . . . respecting the late Mr. Dyas, a respectable apothecary residing in Castle-street, who, when 70 years old, was attacked by chorea in as complicated a form as I ever saw. The disease was very severe, and lasted many months."

It is usually described as the occurrence of generalised and symmetrical choreiform movements of gradual onset and progression in subjects of advanced age; mental changes are said to be absent, and the affection is regarded as independent of other types of chorea in the adult—particularly Huntington's disease and chronic progressive chorea.

Without doubt the term senile chorea has been applied too readily to cases with characteristic movements associated with old age. In order to make this diagnosis, one must be scrupulous to exclude: (1) cases associated with a family history of chorea or insanity; (2) cases in which the chorea has commenced in middle life and has persisted into advanced age; (3) cases of apoplectic onset—usually unilateral in their manifestations. When these criteria are rigidly applied, senile chorea is found to be a rarity.

The physical signs differ only slightly from those of Sydenham's chorea; the movements are perhaps of wider amplitude and more intractable, and tend to show themselves more frequently in the facial and abdominal musculature. In the early stages there is a hypotonus resembling that in Sydenham's disease, but in the more chronic forms a state of rigidity may gradually supervene. The "minor signs"—such as characteristic attitude of the forearms and hands—may be demonstrable at times, but I have never seen either a pendular or a sustained knee-jerk in the senile varieties.

RESTLESS MOVEMENTS.

The most complex types of hyperkinesis are those of the "psychomotor" variety. Within this category are grouped an array of diverse bizarre movements which are "spontaneous" rather than "involuntary" in character. Movements of patting or rubbing the hands together, of touching and stroking objects in the vicinity are not infrequent. There is a characteristic stereotypy in the repetitive nature of these movements. At times it is possible to determine that the movement commences as a deliberate volitional action, which is, however, perseverated long after the initial stimulus has passed (=palipraxia). The bedridden senile patient may at times be found lying with the hands outstretched as if groping or feeling for something. As soon as a person approaches the patient seizes hold of him, grasping his hands or clothing, or he may be seen clutching the bedclothes tightly, which he cannot easily be persuaded to release.

Such manifestations are rarely seen unless some degree of mental enfeeblement is present; they are physical concomitants of senile dementia rather than of pure senility. In that form of presenile psychosis, called presbyophrenia, motor agitation and restlessness are particularly evident.

In advanced cases the movements may become still more complicated. The patient may be seen parcelling up imaginary objects in bed or even transferring to the mouth any article placed in the hand (Stief[110]). A finger, or indeed any object of suitable size, placed near the lips or gums, may evoke movements of sucking and chewing. In their methods of feeding and their primitive response to various stimuli, these demented patients appear strikingly infantile. This reversion towards an infantile state is indeed seen not only in the act of feeding but in the forms of motor hyperkinesis, and in the character of their easily evoked laughter and tears. There is some resemblance also to the behaviour of the older mentally defective child or some of the restless schizophrenic types.

PATHOLOGY AND PHYSIOLOGY OF SENILE HYPERKINESIS.

We have no precise knowledge of the pathological anatomy and physiology of these various types of hyperkinesis. Senile tremor, athetosis, and chorea are all as inexplicable as the more complicated motor activities. The dearth of morbid anatomical data has not prevented, however, a wealth of speculation. There is a universal tendency towards the ascription of these involuntary movements to lesions of the basal ganglia and of the striatum in particular. Thus senile tremor is often compared with the tremor of paralysis agitans and linked with an outfall of small striatal cells. Senile chorea has been associated with a similar degeneration of the pallidal but more particularly striatal cells, together with changes in the dentatum (Jakob[111]); Wilson,[112] however, stresses the importance of changes in the post-central cortex in a personally observed case. The psychomotor types of spontaneous movement have been associated by Kleist[113] with lesions in the external pallidum and in the caudate, and he attributes their appearance to a disordered balance of function between the individual ganglia of the corpus striatum.

In this country we have always been hesitant to ascribe manifestations of an active nature to particular foci of disease, and especially to lesions in the basal ganglia. It is unlikely that striatal lesions should be responsible for such totally diverse phenomena as tremor at one end of the scale and movements of grasping and groping at the other. Theories of striatal dysfunction ignore the cortical changes which are always present at autopsy, and can frequently be suspected clinically. The demonstration of decaying or dead nerve-cells still leaves unexplained what mechanisms are actually producing the movements. Lastly, the pathological processes are too diffuse to allow one to pick out a solitary focus as the cause of a particular symptom.

There are many points of resemblance between senile tremor and the static tremor common in cerebellar disease. The nystagmoid movements of the head, neck, and limbs, their disappearance when the limb is completely supported, and their aggravation by effort recall the cerebellar titubation often seen in disseminated sclerosis. Schuster[114] has published a number of cases in which senile tremor was an early and prominent feature of a cerebellar syndrome, and where at autopsy cerebellar lesions were demonstrable.

When we compare the tracings of tremor in paralysis agitans, or of senile tremor with the curves of voluntary muscle contraction, we see—as first demonstrated by Schäfer—a striking similarity in the presence in both of fine wavy oscillations. This fact suggests that the tremor appearing in such pathological states as Parkinson's disease or senility is no more than the exaggeration of a normal manifestation of muscular contraction; this conception is in accord with the modern views on the pathogenesis of tremor as formulated by Kollarits,[115] De Jong,[116] and others. Walshe,[117] in a recent Oliver-Sharpey lecture, suggested that tremor is not a new phenomenon indicating a peculiar mode of innervation of pathological nature, but rather an emergence of a ormal cortical rhythm. The reason why this rhythm does not appear in health is problematical, and may depend upon the presence of a damping-down mechanism at a lower neuronic level; in tremor enilis and in parkinsonism this inhibitory mechanism s perhaps defective, permitting the unbridled activity of cortical impressions. The site of this ower-level control is unknown.

Cerebellar Syndromes.

It is striking how often cerebellar lesions are demonstrable at the post-mortem examination of very aged individuals, in the absence of corresponding clinical manifestations. Thus foci of softening or ocal or widespread atrophy may exist apparently without characteristic signs. Obviously, it is arguable that minor degrees of hypotonus and incoördination may have been overlooked, either through inadequate examination or on account of the patient's inaccessibility. Or the cerebellar signs may have been overshadowed by more striking coexistent pyramidal or striatal manifestations. It is doubtful, however, whether these arguments can explain away all the clinico-anatomical discrepancies.

Cerebellar symptoms, therefore, are rather uncommon in old age, but at times they are demonstrable and may even exist in marked degree. Such signs include diminution in muscular tonus, although occasionally rigidity occurs in the senile cerebellar atrophies. Incoördination of the limbs and trunk causes characteristic disturbances in the gait. The patient's efforts at walking may be accompanied by an ataxia of such severe and bizarre nature as to raise the suspicion of an hysterical basis. Tremor of the limbs, and particularly of the head, is common, and is usually much enhanced by muscular effort as well as by emotional stimuli. Nystagmus may occur, but is exceptional. Speech defects of diverse type are encountered, many of which recall the slow, scanning, explosive dysarthrias of advanced disseminated sclerosis. Schuster has published a series of cases of senile cerebellar atrophy in which the speech was inspiratory in character and unusually loud, as if the patient were being throttled; this variety is named by Schuster "the sea-lion speech." Motor power may be impaired to some degree, being most obvious in the performance of finely coördinated manipulations, and in rapidly alternating movements.

These physical signs may be present in old age, either singly or combined with other neurological manifestations, under various conditions, which may be briefly enumerated.

CEREBELLAR VASCULAR DISEASE.

Bilateral infarctions in the cerebellum will give rise to the sudden appearance of cerebellar signs affecting first one side of the body and later the other. The presence of concomitant softenings in the brain-stem—depending upon the particular vessel occluded—will modify the picture and produce cranial nerve palsies, pyramidal signs, and sensory loss.

At other times a large number of foci of vascular disease are scattered throughout the cerebrum and cerebellum, and lead to bilateral hemiplegias with added cerebellar signs. Thus arise the various "cerebellar types of pseudobulbar palsy," so ably described by Raymond and Alquier,[118] Lhermitte, Cuel, and Kyriaco, and others.

SENILE CEREBELLAR ATROPHIES.

Diffuse atrophic processes may occur involving part or all of the cerebellum, and even some adjacent structures. Three nosological subgroups may be isolated — namely, olivo-ponto-cerebellar atrophy (Dejerine and Thomas[119]); olivo-rubro-cerebellar atrophy (Lhermitte and Lejonne[120]); and delayed cortical cerebellar atrophy (Rossi,[121] Marie, Foix, and Alajouanine[122]).

The first is characterised pathologically by a loss of intragranular fibres in the cerebellar cortex, together with atrophy of the ventral part of the pons and of the middle cerebellar peduncle. No fibres are to be seen in the hilus of the olive, the medial lemniscus, or the peduncle of the restiform body. The external arcuate fibres are missing. Winkler[123] associates these changes with an affection of the neo-cerebellum.

In the so-called olivo-rubro-cerebellar atrophy there is a global atrophy of the cerebellum and of the dentate nuclei; the superior cerebellar peduncle is affected as high as the red nucleus. The olives and the restiform bodies are atrophied, but the other bulbar nuclei are intact.

In the third variety—delayed cortical cerebellar atrophy—the process is confined to the antero-superior aspect of the vermis and the anterior part of the quadrilateral lobe. A portion of the olives may also be affected. Here the distribution of the atrophy corresponds approximately with Edinger's conception of the palæo-cerebellum.

All three types are associated with a slowly progressive interference with gait, equilibrium, and coördination, accompanied at times by speech defects. Our knowledge of the symptomatology of olivo-rubro-cerebellar atrophy is at present limited to one case, but the points of similarity and of contrast between types 1 and 3 may be set out in the following Table:—

—	*Olivo-ponto-*cerebellar atrophy.	Delayed cortical cerebellar atrophy.
Familial incidence	Occasionally.	No.
Age of onset ..	Up to 60.	40–75. Average = 60.
Course	Gradual.	Gradual.
Gait	Ataxic.	Wildly ataxic.
Titubation of head	Yes.	Occasionally.
Spontaneous tremor	Yes.	—
Incoördination ..	Legs = arms.	Legs more than arms.
Asynergia ..	Yes.	Yes.
Intention tremor	Yes.	Slight.
Speech	Slow; monotonous; scanning; dysarthric: "sea-lion speech."	Slow; monotonous; dysarthric. At times scanning.
Nystagmus	Usually none.	Slight or none.
Tonus	Diminished.	Usually diminished; occasionally increased.
Vestibular functions	Normal.	Normal.
Motor power ..	Slightly impaired.	Slightly impaired.
Reflexes	Ankle-jerks often absent.	Ankle-jerks often absent. Occasionally bilateral extensors.
Cranial nerves ..	—	Normal.
Sensation	Normal.	„
Sphincters	Impaired in later stages.	—
Psychical state ..	Deterioration in late stages.	Normal.

It is obvious that the clinical differences between these two groups are very slight, and it is debatable whether any clear-cut distinction actually exists between these two disorders.

HEREDO-FAMILIAL ATAXIES OF LATE ONSET.

Although we associate the symptoms of familial cerebellar disease with the first two decades, occasionally the signs commence in the elderly or even in the aged. The importance of these rare cases is great in their bearing upon the genesis of hereditary disease in general.

An instance of the delayed appearance of neurological symptoms—largely of cerebellar character—

is seen in the remarkable family recorded by Ferguson and myself,[124] where the average age of onset was between 35 and 45. In two out of three members of Holmes's family[125] with cerebellar atrophy the symptoms started in the fourth decade. Sanger Brown's[126] ataxia also commenced in maturity. In an interesting familial affection recorded by Schuster, extending through three generations, five members first showed marks of a progressive cerebellar lesion between the ages of 50 and 60. Perhaps the most striking example is in the family recorded by Neff,[127] where 14 members belonging to four generations were affected. In 11 of these, the age of onset was between 50 and 65; in two others the symptoms commenced at 68 and 72 respectively.

Senile Paraplegia.

One of the commonest neurological symptoms in old age consists in a progressive weakness of the lower extremities with the frequent development of contractures.[128] Cases differ markedly one from another both in the degree of paresis and in the distribution and character of the hypertonus; paraplegia in flexion is the common experience; less often paraplegia in extension is seen. The state of the reflexes is variable; sensory changes may or may not be present, and the state of the sphincteric control is inconstant.

The term "senile paraplegia" is purely descriptive, and offers no clue as to the morbid anatomy. Since there is often a vascular basis to the paraplegia, it happens that analogous cases may be seen before the onset of old age; hence "arterio-sclerotic paraplegia" would be an alternative title in some cases.

As in so many other senile syndromes, changes are usually demonstrable at all levels of the nervous system, so that exact correlation between clinical and pathological data becomes impossible. At times, however, the morbid change is more or less limited to one particular region; in this way certain relatively pure varieties of senile paraplegia may be isolated. Thus one may enumerate the chief types as cortical, subcortical, spinal, or muscular.

CORTICAL TYPE.

The cortical senile paraplegias are characterised by a clinical picture resembling the following: a symmetrical or asymmetrical weakness of the legs which may be of gradual or abrupt development. Or one leg may suddenly become weak, followed after an interval by a similar apoplectic weakness of the other limb. A paraplegia in extension develops first, but later a flexion attitude may supervene. Signs of pyramidal disease are recognisable in a characteristic spasticity with exaggerated tendon-jerks, clonus, and Babinski responses. Sensory changes are typically absent, and there are no sphincteric palsies. Concomitant symptoms may include mental change; psychomotor defects in the arms of an apractic or hyperkinetic origin; movements of grasping are particularly common.

A degeneration in the longest pyramidal fibres descending from the two leg centres as the apex of the motor cortex constitutes the characteristic anatomical basis. Such a process may arise as a pure neuronic decay, independent of circulatory disturbance. This type—so often quoted as the usual cause of senile paraplegia—is actually the rarest, and, indeed, I have been unable to trace unequivocal evidence as to its occurrence in pure form. The second and much commoner cause depends upon arterial disease. The leg area differs from the rest of the Rolandic cortex in being supplied by the anterior as opposed to the middle cerebral artery. Occlusion of the anterior cerebral artery will, therefore, produce a crural monoplegia; a bilateral thrombosis will cause a paraplegia. This latter usually results from two separate strokes but occasionally, because of a congenital or acquired vascular anomaly, one anterior cerebral artery will supply the leg areas of both hemispheres. Thrombosis will, therefore, cause a sudden paralysis of both lower extremities.[129]

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Multiple softenings scattered throughout the white matter, internal capsule, basal ganglia, and brain-stem often result in a type of paralysis which has been termed "intracortical" or, better, "subcortical" paraplegia.

In such cases there arises a slowly progressive paresis of the legs without sensory loss. A hypertonus of mixed type is usually present, and reflex changes may occur indicating involvement of the pyramidal tracts. The sphincters may be intact, but more commonly there is "psychical" type of incontinence. Pseudobulbar and parkinsonian signs, as well as mental change, are frequently associated. Indeed this particular type of paraplegia usually forms part of a broader arteriopathic syndrome which may belong to the cadre of progressive lacunar disintegration, arterio-sclerotic parkinsonism, or démence paraplégique.

Another type of subcortical paraplegia may develop in the senile. The patient, having sustained a hemiplegia, takes to his bed; gradually extensive contractures and deformities appear which further incapacitate him, and slowly the paralysed leg loses its attitude of extension and becomes more and more flexed. Still later the opposite non-paretic leg becomes similarly affected, so that a condition of paraplegia in flexion develops. Signs of pyramidal disease are demonstrable, of course, in the hemiplegic limb only.

It is evident that these subcortical types of senile paraplegia are essentially the effect of vascular disease rather than of any primary or "senile" neuronic decay.

SPINAL TYPE.

In the myelopathic varieties of senile paraplegia the maximum, if not the sole morbid change, is situated within the spinal cord. Such varieties are rarely diagnosed during life, although specifically described by Demange[130] in 1885 as "progressive tabetic contracture."

Here the signs include a symmetrical weakness of the legs, either of gradual or abrupt appearance. Spasticity is present, chiefly of pyramidal type, and a flexion attitude usually develops. Subjective and objective sensory disturbances are frequent; wasting of the muscles with fibrillation is not uncommon. Sphincter defects typical of spinal lesions will here be present.

Two chief pathological changes may cause a spinal type of senile paraplegia. First, there may be a slowly progressive combined sclerosis of the cord, the lateral and posterior columns showing the maximum change. This process, which differs only in degree from that described in our consideration of the senile cord, may possibly result from disease of the finer branches of the nutrient vessels, leading to a chronic ischæmia. This type of change will be associated clinically with the slowly progressive paraplegias accompanied by ataxia and dysæsthesiæ and objectively by defective postural sensibility.

The other type of myelopathy depends upon sudden occlusions of the larger spinal arteries; infarcations of the cord result which cause a sudden development of signs of a transverse lesion. Pathological and clinical differentiation from cases of myelitis may be difficult.

MUSCULAR TYPE.

The fourth type of senile paraplegia often accompanies changes in the brain, cord, and peripheral nerves, but may also occur in isolated form. It is actually independent of disease of the nervous system, and consists in hardening of the muscles of the lower extremities. A senile hyperplasia of the interstitial tissue of the muscles, under the terms "progressive myosclerosis" or "senile myopathy," was originally described by Lhermitte,[131] both alone and in collaboration with Lejonne.[132] Atrophy, pigmentation, and plasmoidal regression of the muscle-fibres are found, some of which are hypertrophied. The connective tissue between the bundles, and also between the individual fibres, is enormously proliferated. Accumulations of small round cells distend the lymph spaces.

The clinical correlates of this type of change comprise a gradual stiffness and weakness of the legs, accompanied by some wasting and vague pains.[133] Examination reveals an extreme flexion contracture; passive manipulation is scarcely possible, and its attempts evoke pain. Indeed the limbs may not be extensible, even under deep anæsthesia or after death, on account of powerful contractures around the joints. The muscle bellies and tendons stand out prominently, and on palpation the muscles are hard and wooden, and are distinctly tender. Sphincteric and sensory changes are absent; the plantar responses are flexor in type; the knee- and ankle-jerks are usually unobtainable. The myosclerosis affects almost exclusively the lower limbs, and here the extensor group of muscles is affected earlier and more severely than the flexors.

In addition to the foregoing examples of paraplegia, where the severity of the symptoms actually prevents walking or standing, there are numerous minor degrees of weakness of the legs leading to characteristic disorders of the gait. Between these latter and the senile paraplegias proper there is no frontier, the differences being merely those of degree.

DISORDERS OF GAIT.

The most characteristic type of gait in old age is seen in the *marche à petits pas.* In the early stages this is betrayed by a mere loss of elasticity, some shortening of the steps, and a slight widening of the base. Such a gait may almost be regarded as characteristic of healthy old age. Later, however, the defects become exaggerated; the patient assumes a slightly flexed attitude and advances slowly by very small steps. A subjective sense of propulsion is often present. This particular gait is encountered not only in numerous cases of old age but also in the pseudo-bulbar and lacunaire syndromes. By slow gradations it passes over into a more typical parkinsonian type, with shuffling steps and loss of the movements of arm swinging, and finally into the second or subcortical type of senile paraplegia.

Cerebellar lesions have already been mentioned as causing marked interference with walking. This type of disturbance is characterised by a reeling, titubant gait, punctuated by occasional falls. There is an accompanying sense of insecurity, and the patient endeavours to maintain his equilibrium by widening his base. In the autobiographical descriptions left by Dr. Holyoke, who died at the age of 101, we have an instructive account of this type of disability, together with some interesting comments as to its causation. Writing at the age of 98, he said:—

> ". . . in walking I was apt to lose my equilibrium and sometimes to stagger like one intoxicated, particularly if I looked up to see the town clock or how the wind blew, in doing which I have several times nearly fallen to the ground; this complaint gradually increased. . . . My idea of the disease is this—I presume that we are not able to walk steadily unless the cavity of the cranium be so full as to prevent the brain from being agitated when the head is in motion. I presume also that by disease or old age the brain may be so shrunk or shrivelled as to leave such a vacuity as to allow the brain to vacillate and so produce the staggering and unsteady walking so common to persons much advanced in age. . . . May not the tottering and proneness to fall incident to age be accounted for by supposing the brain to shrivel and contract . . . so as to leave a vacuity; and may not that vacuity be supposed to contain a fluid. . . . ? Now if this fluid does not occupy so much space as the brain did, the function of the brain may not be injured, although the instability may be much increased."

It is interesting to note that at the autopsy of this gentleman an atrophy of the cerebellum was the most striking abnormality.

Eighty years later von Malaisé,[134] apparently unaware of Dr. Holyoke's note, described a peculiar ataxic gait of cerebellar type, which he associated with a senile internal hydrocephalus.

In some cases the grossly incoördinate gait suggests an element of hysteria. This suspicion is perhaps strengthened when the integrity of the motor power of the legs as tested with the patient in bed is contrasted with the great difficulty in walking. Such types of gait constitute the astasia-abasias of the aged. One must be cautious, however, before lightly assuming such manifestations as functional; it is probable that in some cases at least the defect is of an apractic character and bears no relationship to hysteria. The same qualification applies to the so-called Petrén's[135] gait, where there is a difficulty in continuing the movements of walking; after a few steps the patient feels he can go no further, but with coaxing and by dint of concentration upon the movements of the legs the patient can start again. Von Malaisé rightly disagrees with Petrén, and points out that such a gait is certainly of organic nature, and probably associated with psychical disorder.

Lastly, it must be remembered that an abnormal gait in the aged is frequently the result of disease outside the nervous system. Thus, changes in the joints and periarticular tissues are common causes of difficulty in walking in old age, as exemplified by arthritis deformans, spondylose rhizomélique, and morbus coxæ senilis.

Trophic Alterations.

The important metabolic changes occurring in old age cannot be detailed here: neither will time permit a discussion of the interesting alterations in the skin and its appendages, the endocrine organs, or the various sympathetic and vegetative syndromes met with in the aged. One trophic change only will be discussed—namely, senile obesity—in that there is probably direct bearing with a cerebral lesion.

A progressive emaciation is, of course, one of the usual accompaniments of advanced age. As Rolleston has pointed out, the fat-cells of the subcutaneous tissues may become replaced by fluid—the so-called serous atrophy—or the cells may revert to the condition of connective tissue cells. Occasionally, however, a condition of marked adiposity is encountered in the very aged, which, because of its recent development and pathological degree, merits the title "senile obesity." One must carefully distinguish these cases from those where the adiposity is of long is seen in the remarkable family recorded by Ferguson and myself,[124] where the average age of onset was between 35 and 45. In two out of three members of Holmes's family[125] with cerebellar atrophy the symptoms started in the fourth decade. Sanger Brown's[126] ataxia also commenced in maturity. In an interesting familial affection recorded by Schuster, extending through three generations, five members first showed marks of a progressive cerebellar lesion between the ages of 50 and 60. Perhaps the most striking example is in the family recorded by Neff,[127] where 14 members belonging to four generations were affected. In 11 of these, the age of onset was between 50 and 65; in two others the symptoms commenced at 68 and 72 respectively.

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THE PATHOLOGY AND ÆTIOLOGY OF BRAIN ABSCESS.*

BY WILLIAM EVANS, M.D., M.R.C.P.LOND.,
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THIS paper gives the results of personal observations, and of an analysis of the records of necropsies performed between 1908 and 1925 in the Bernhard Baron Institute of the London Hospital.

The term "brain abscess" may conveniently be employed to denote abscesses in the cerebrum, cerebellum, and brain stem. The process commences with inflammatory leucocytic infiltration and softening of the cerebral substance, and ends in the conversion of a portion of the brain into a cavity containing pus. The *acute* form of abscess was found to have no distinct wall; when the pus was evacuated the abscess cavity was lined by a shaggy and ragged detritus, whilst the adjacent brain tissue was markedly œdematous, and generally presented multiple, minute and scattered hæmorrhages. The *chronic* and clinically more latent type of brain abscess was surrounded by a definite wall. Internally the wall was composed of purulent tissue, the so-called "pyogenic membrane." External to this was a layer of granulation tissue composed of various proportions of fibrous macroglia and of fibrous tissue derived from the vascular adventitia and, in some instances, from the leptomeninges. The granulation tissue was infiltrated with plasma cells, lymphocytes, and a few eosinophil leucocytes; the infiltration was continued *in the* adventitia of the vessels for a considerable distance into the surrounding brain.

Abscess content.—In the *acute* abscess this appeared as a pale yellow creamy fluid, or was red from hæmorrhage. The content of the *chronic* abscess presented a more characteristic appearance. It usually consisted of fœtid, greenish-yellow or bright green, viscid pus. In both cases microscopic examination revealed pus cells, and the causative organism or organisms.

Bacteriology.—Any of the pyogenic organisms may be present as the exciting cause. When the abscess had resulted as a complication of middle-ear and mastoid infections, the organisms present were generally multiple; staphylococci, streptococci, pneumococci, and various Gram-positive and negative bacilli were commonly found together; in some cases, however, this type of abscess showed pneumococci alone. In the abscess complicating intrathoracic suppuration, the streptococcus was frequently grown in pure culture. Similarly, the staphylococcus was usually the only organism isolated from the multiple brain abscesses that formed in a general systemic pyæmia resulting from osteomyelitis. A mould was found in one case of abscess secondary to bronchiectasis. In a number of cases the abscess content was sterile, no bacteria being discovered on examination of a stained film or by culture in different and suitable media.

Size of abscess.—In the series of 194 cases investigated, careful measurements of the abscess were noted in 168 instances. In 7 it was larger than an orange. In 5 it was linear and consequently unsuitable for comparative measurements. In 14 the size had not been noted or had been described in vague terms of "large," "small," &c. For easy comparison it is convenient to group and classify them in relation to common objects whose sizes are familiar and easily appreciated, and to which each abscess conformed in size but not necessarily in shape. Such a scheme is presented in Table I.

TABLE I.—*Classification of Abscesses according to their Dimensions.*

Numerals denote number of cases.

Size of abscess in terms of objects of familiar magnitude.	Nature of spread of the infection to the brain.		
	Direct extension.	Hæmatogenous.	Uncertain.
Larger than orange ..	6	—	1
Tangerine orange ..	25	—	6
Billiard ball	23	3	4
Golf ball	20	10	3
Walnut	20	5	1
Cherry	18	5	—
Pea	5	9	—
Pinhead	1	10	—
Allotriomorphic ..	5	—	—
Size not accurately noted	8	4	2

The data in this Table indicate that the size of a brain abscess may vary from that of a pinhead to an orange or bigger, and that the larger variety occurs with a much greater frequency than the smaller. They also illustrate that whereas the abscess that is formed as the result of a direct local spread of the primary infection tends to be of a larger size, the abscess that follows the transmission to the brain by the blood stream of infected material from a distant focus of suppuration is more commonly small. In regard to the latter group, when the brain abscess was a part of a systemic pyæmia, it had usually formed as a terminal event and was generally less or no larger than a pea. Where, however, intrathoracic suppuration in the form of bronchiectasis or empyema had given rise to the abscess, it was frequently of a large size.

The size of the abscess also bore an important relationship to its site. The size tended to vary inversely with the rapidity of onset of serious symptoms and death. Thus, an abscess having its seat in the so-called "silent areas" of the brain sometimes reached very extensive dimensions before it gave rise to symptoms sufficiently distressing to compel the patient to seek medical advice and treatment; whereas an abscess formed in the internal capsule or its immediate neighbourhood soon gave rise to a mono- or hemiplegia. This intimate relationship between site and size was further very well illustrated in the case of a cerebellar abscess. Here, invariably, the abscess was of small dimensions, for as soon as the process of suppuration had resulted in the destruction of a portion of cerebellum equal in size to that of a grape, it destroyed in its further extension important communicating fibres situated in the cerebellum, and injured the cranial nerves located in this region, and so introduced early and distressing symptoms. Further, like other subtentorial lesions it proved more potent in producing an increase in the "intracranial tension" with its concomitant ill-effects on the important centres situated in the medulla. Those entered as allotriomorphic in Table I. are abscesses which were of an irregular and elongated shape, and had been produced by the entry into the brain substance of a foreign body in the form of a spicule of bone, bullet, or portion of shrapnel.

Shape of abscess.—Most commonly the abscess was spheroidal, but in 27 per cent. of the cases in the series of necropsies investigated it was ovoid. When standing and does not really belong to the old age period.

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* Based on a paper awarded the K. E. D. Payne Prize at the London Hospital in 1927. The sequel will appear next week.

The deposition of fat in senile obesity is universal, but there is a striking involvement of the limbs, including the most distal segments. Here the fat tends to become aggregated into large masses, which are freely mobile over the deeper tissues, and over which the skin itself is movable. Such masses are especially common over the dorsum of the hands, around the ankle-joints, and in the region of the olecranon and patella.

Morel has pointed out that obesity of this type is a frequent accompaniment of a particular senile pathological change—namely, hyperostosis of the internal table of the frontal bone. In such cases other symptoms commonly appear, some of which suggest an interference with the vegetative centres in the diencephalon. The complete Morel's syndrome includes mental deterioration, headaches, and, at times, epilepsy; disorders of sleep; polyuria; polydipsia and polyphagia; asthenia.

Senile Epilepsy.

Very occasionally attacks of typical epileptiform character make their first appearance during the senile period. The attacks may be ushered in by an aura, and are indistinguishable in their clinical accompaniments from those of genuine epilepsy. There are no paralytic sequelæ. In the particular variety described by Dr. Barber,[136] the patient, while in the fit, may cry out and behave in an excited and disorderly manner.

The causation of senile epilepsy is probably diverse; there seems to be no close association with genuine epilepsy among other members of the patient's family. In perhaps the majority of cases arterio-sclerosis constitutes the responsible ætiological factor. Minute softenings, slight arterial or possibly venous hæmorrhages, or the sudden production of a lacune of cerebral disintegration may be the immediate agent. Senile epilepsy is, therefore, better described as "arterio-sclerotic epilepsy" in the majority of cases.

Some instances of fits commencing in middle or late life are associated with the development of one of the presenile dementias. Alzheimer's disease is not infrequently characterised by recurrent attacks of unconsciousness.

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Age (years)			
0– 5	12		
6–10	15		
11–15	29	13	
16–20	31	14	17
21–25	29	14	15
26–30	14	6	8
31–35	28	7	21
36–40	11	3	8
51–55	5	2	3
56–60	1	—	1
61–65	—	—	—
66–70	1	—	1
Total ..	194	79	115

B.A. = Number of cases where brain abscess was found at necropsy; F. = females; M. = males.

Sex.—The present investigation showed that the incidence of brain abscess is in no way determined by the sex of the patient; the lesion was found in males and females in equal proportion in relation to total necropsies conducted. Table II. appears to indicate that brain abscess was a commoner finding in males than in females in the ratio of 3 to 2, but the total necropsies investigated were also found to bear a similar sex ratio. This is indicated by Table III.

MOTOR ACCI… FEES

(A) Spread by Direct Extension.

In 131, or 67·5 per cent., of the cases brain abscess had resulted from direct extension to the brain of infection which had originated at a site not far removed from the brain itself. Six possible sources of infection are alluded to in this group. Of these, the middle ear and antrum were the source in 109 cases, or 83·2 per cent., and the nasal cavity and its accessory sinuses the source in 12 cases, or 9·1 per cent. The six sources will now be discussed separately.

OTITIS MEDIA AND MASTOIDITIS.

Inflammation of the tympanic cavity, with or without similar involvement of its antrum, was the cause of 56 per cent. of all brain abscesses. Amongst 10,280 necropsies otitis media was noted in 718, and in 74 of these, or 10·3 per cent., brain abscess was a complication. Only four occurred in patients under 5 years of age, whilst the majority were found in adults of 20 to 35 years.

The abscess had most commonly formed in the cerebrum, and then almost invariably in the temporo-sphenoidal lobe, but it was also frequently localised in the cerebellum. In 62 cases the abscess was cerebral; in 40 the abscess had formed in the cerebellum; in 7 cases both cerebral and cerebellar abscesses were present. For every three cerebral abscesses there were, therefore, two cerebellar. In 56 of the 62 cases of cerebral abscess it was situated in the temporo-sphenoidal lobe, and in the remaining 6 in the occipital, parietal, or frontal lobes.

It remains to discuss the path traversed and the method of spread assumed by the infection. For this purpose it is convenient to arrange the cases in four groups.

(*a*) *Purulent thrombosis of the lateral sinus.*—The infection had spread by this route in 37 of the 109 cases in which brain abscess had resulted from otitis media or mastoiditis. In 28 of these the abscess was found in the cerebellum; in only 9 in the cerebrum. The intimate anatomical relationship between the lateral sinus and the cerebellum explains the frequency with which the lesion was located in the latter. The earliest evidence of extension of infection into the lateral sinus was shown by a small nodular projection of granulation tissue adherent to the sinus wall. In the next stage observed the sinus was filled with purulent thrombus. Further extension was demonstrated in some cases by thrombosis of the cerebellar veins draining into the sinus; in these cases an abscess had already formed.

(*b*) *Osteomyelitis of the tympanic wall.*—Measurements of the roof of the tympanic cavity in a series of consecutive subjects of different ages proved it to average 1·5 mm. in thickness in adults, and in 25 per cent. it was found to be almost transparent; in children under 10, however, it was a much more substantial structure, averaging 2 mm. in thickness; it was also of a tougher consistence and not so brittle as in adults of 25 years or older. The posterior wall of the tympanum averaged 3·5 mm. and that of the mastoid antrum 3 mm. in thickness. It is not surprising, therefore, that the infection from middle-ear disease reaches the brain most frequently by osteomyelitis, necrosis, and perforation of the roof of the tympanic cavity. Of the 109 cases in which the brain abscess had followed middle-ear infection, 28 fall into this group. In 23 instances the abscess was situated in the temporo-sphenoidal lobe; it had followed necrosis of the tegmen tympani in 20 cases, and the roof of the mastoid in three. The abscess was localised in the cerebellum in five cases, the infection having spread by osteomyelitis and necrosis of the posterior wall of the mastoid antrum. A study of examples of otitis media and mastoiditis showed the following results of necrosis of the bone:—

1. The opposing part of the dura became intimately adherent to the inflamed bone and ultimately became perforated resulting in a generalised or localised lepto-meningitis.
2. The lepto-meninges became adherent around the perforation and to the underlying portion of the cortex, and a brain abscess was subsequently formed.
3. Occasionally an extradural abscess formed. Here also the infection spread inwards and formed an intradural abscess, but without causing visible perforation of the dura. The cerebral abscess was then established by infection of the lepto-meninges as in the previous instance.

(*c*) *Spread via the internal auditory meatus.*—This form of spread of the infection from the tympanic cavity to the brain only occurred in one case. The resulting abscess had its seat in the cerebellum. The sequence of events appeared to have been as follows—the suppurative process had entered the aqueductus fallopii from the middle ear by *osteomyelitis of its* wall, and extending along this canal had conveyed the infection into the internal auditory meatus; subsequently it had given rise *to a localised lepto-meningitis*, and the formation of an abscess (2 by 1·5 cm.) in the antero-external angle of the right lobe of the cerebellum.

(*d*) *Spread along adventitial spaces of perforating blood-vessels.*—In 43 cases there was no evidence of spread by any of the above methods, (*a*), (*b*), and (*c*). In these cases there was a focal inflammation of the dura and subjacent lepto-meninges, which bound the meninges to the surface of the cerebrum or cerebellum. But the abscess beneath was separated from the meninges by a zone of macroscopically unaltered cortex and medulla. The probable method of spread in those cases was extension of inflammation from the subarachnoid space along the Virchow-Robin space of perforating vessels. Unfortunately, no microscopic examination was made.

SUPPURATION IN NASAL CAVITY AND ITS ACCESSORY SINUSES.

In 12 cases the brain abscess had resulted from the direct spread of infection from suppuration occurring within the nasal cavity and its accessory sinuses. In two other cases multiple brain abscesses had followed frontal sinusitis in the one case and a purulent rhinitis complicating resection of the nasal septum in the other. These cases, however, do not belong to this section, because the method of spread of infection differed: the brain abscesses were part of a general pyæmia, and the method of spread was embolic. Suppuration occurring within the nasal cavity and its accessory sinuses is, therefore, responsible for 7·2 per cent. of all brain abscesses. It may be of significance that seven of the 12 cases occurred in subjects under 17 years of age, that is, during a period when the frontal, sphenoidal, and ethmoidal air sinuses were in the course of development. Of the accessory nasal sinuses the frontal most frequently gave rise to cerebral abscess. The frontal provided the seat of infection in seven cases; the sphenoidal sinus in four. In only one case had the infection spread from the nasal cavity. The *primary* seat of the infection need not necessarily lie in the sinus which eventually provides the path of direct extension to the brain. In 75 per cent. of the cases suppuration was found to involve more than one sinus. A consideration of the intimate anatomical relationship which each of these sinuses bear to one another, and especially the close proximity of their openings into the main nasal cavity, amply explains why it is unlikely that suppuration occurring in any single sinus will remain confined to that sinus for any length of time. When the frequency of purulent rhinitis arising from nasal polyps, deflection of the septum, &c., is appreciated, it is surprising that brain abscess does not more frequently result from the tracking of infection either to the subarachnoid space along the nerves which pass through the cribriform plates or to the dura along the veins which open into the sphenoidal venous sinus, or from necrosis of the cribriform plates. The fact that good drainage is afforded to suppuration occurring at the root of the nose appears to account for the comparative rarity of intracranial complications in such conditions. It is now necessary to consider in greater detail the method of spread of suppuration from the frontal and sphenoidal sinuses and nasal cavity.

(*a*) *Osteomyelitis of the sinus wall.*—The walls of the accessory nasal sinuses are very thin. Measurements of the thickness of the posterior wall of the frontal sinus in a series of cases showed that it seldom had a uniform thickness throughout. The maximum thickness varied from a mere line up to 3 mm.; most commonly it averaged 1·5 mm. The orbital plate of the frontal was found to be thinner, and in the majority of the skulls examined proved to be a sheet-like structure. In seven of the 12 cases spread had occurred by osteomyelitis of the wall. Such spread occurred in five out of seven cases in which the frontal sinus was the source of infection, and in only one out of four cases in which the sphenoidal sinus was the source. In one other case which demonstrated this method of spread the focus of infection was in the nasal cavity. The osteomyelitis was generally extensive in character and diffuse in its distribution.

(*b*) *Spread along perineural spaces.*—This path of infection appeared to be the one traversed in three of the 12 cases. In two of these an abscess had resulted in the frontal lobe and the source of infection was situated in the frontal sinus, whilst in the third case the abscess had formed in the temporo-sphenoidal lobe, the infection having spread from the nasal cavity via the sphenoidal sinus. In all three cases the walls of the sinuses in direct relationship to the brain were found to be free from osteomyelitis, and meningitis was the first visible step in the path of infection.

TABLE IV.—*Conditions Associated with the Formation of Brain Abscess secondary to Suppuration occurring in the Nasal Cavity and its Accessory Sinuses.*

Age.	Lobe of brain in which abscess was situated	Diameter or size (cm.).	Sinus which formed initial seat of infection.	Sinus from which infection was finally transmitted to brain.	Other sinuses affected	Method of spread to brain.
16	Fr.	3·5	N. cav.	N. cav.	Eth.	Osteomy.
13	Fr.	1	Fr.	Fr.	Eth.	,,
44	Fr.	2 & 3·5	N. cav.	Fr.	Sph.; max.; eth.	,,
15	Fr.	1·5	N. cav.	Fr.	Max.; sph.	,,
9	Fr.	2·5, 3 & 4	Max.	Fr.	—	Perin.
16	Fr.	4·5	Fr.	Fr.	—	Osteomy.
68	Fr.	4 × 3 × 2	Max.	Fr.	—	Perin.
54	Fr.	2	Sph.	Sph.	Eth.	Osteomy.
14	Temp.-sph.	3·5	N. cav.	Sph.	Eth.; max.	Perin.
45	,,	2·5	Sph.	Sph.	—	Along veins.
14	Fr.	0·8 × 0·5	Fr.	Fr.	—	Osteomy.
31	Temp.-sph.	0·8	Sph.	Sph.	Eth.; fr.	Along veins.

Fr. = Frontal; Temp.-sph. = temporo-sphenoidal; N. cav. = nasal cavity; Max. = maxillary; Eth. = ethmoidal; Osteomy = osteomyelitis; Perin. = perineural.

(*c*) *Extension along veins opening into the cavernous sinus.*—In two of the 12 cases spread of the infection to the brain had occurred along veins which drained into the cavernous sinus. In both instances the [illegible]rimary seat of the infection was situated in the [illegible] sinus. There was no evidence of osteo- [illegible] the sinus wall. Purulent thrombosis [illegible] sinus was present and the resulting [illegible]h had its seat in the temporo- [illegible] in each case associated with [illegible]gitis.

[illegible] cases the position of the resulting [illegible] found to depend partly upon the sinus affected and partly upon the extent of leptomeningitis. Thus, when the cerebral abscess had formed as a complication of frontal sinusitis, purulent rhinitis or infection of the ethmoidal air-cells and the leptomeningitis was localised, the abscess was invariably in the inferior aspect of the frontal lobe. Similarly, when the infection had spread from the sphenoidal sinus the abscess was found to occupy the temporo-sphenoidal lobe. When, however, the meningitis had extended to involve a large area of the surface of the brain, it was found that the abscess occasionally occurred at a site far removed from the sinus whence the infection had spread.

The size and chronicity of the abscess varied. When the sinusitis had remained undetected or untreated and the meningitis had remained localised, the abscess had ultimately assumed fairly large dimensions (see Table IV.), and had produced no symptoms until it had emptied itself into the lateral ventricle and had given rise to the grave and catastrophic symptoms associated with pyocephalus.

FOLLOWING TRAUMA OF SKULL.

In eight cases, or 4·1 per cent., infection had been conveyed to the brain by the introduction of a foreign body. In these the abscess had resulted from puncture-fractures of the skull. Bullet and shrapnel wounds sustained during the late war caused the abscess in five cases. No example of brain abscess was found at necropsy in 318 cases in which death had followed bruising, hæmorrhage, or laceration of the brain without puncture of the skull. A study of fractures of the skull other than puncture-fractures showed that the fracture either had healed without deleterious effects and complications or had proved fatal from severe cerebral laceration or hæmorrhage soon after the infliction of the injury. In the eight examples of puncture-fractures of the skull the initial injury had not produced instantaneous death. In each case localised meningitis had resulted, and a chronic abscess had formed. In one case, that of a child aged 13 months, an abscess the size of a billiard ball had followed a perforating wound sustained by a fall. In another case, in a child aged 8 months, a punctured wound wrought by a knife had dislodged a spicule of the internal table of the skull which in turn caused perforation of the dura. The layer of brain cortex superficial to the abscess was found to be healthy on macroscopic examination, and thus appeared to illustrate spread of the infection by the adventitial or Virchow-Robin space of perforating vessels. Of the five cases contracted during the late war three had resulted from bullet and two from shrapnel wounds. In one case the bullet was found lodged in the abscess wall; in two the abscess had formed around spicules of bone displaced by the entry of a bullet which had left the skull; in the remaining two cases fragments of bone and pieces of metal were found in the edge of the abscess. The abscess which had formed in some of these cases lay at some little distance from the seat of the bullet or piece of shrapnel, and was localised to a portion of the track along which the foreign body had travelled. The abscesses in this group were not confined to any particular lobe or portion of the brain, and their shape and outline were usually very irregular (see allotriomorphic group in Table I.).

INVASION OF BRAIN BY MALIGNANT GROWTHS.

Two cases in the series investigated fall within this subdivision. In one case the contents of the left orbit had been removed, and a retro-orbital sarcoma had been incompletely removed six months previously in a boy aged 10 years. At necropsy the orbital plate of the frontal bone was found to have been eroded by the growth, purulent infiltration of the growth had extended to the frontal lobe of the brain, and a localised abscess had formed at this site. In the other case (male aged 37 years) a purulent squamous-celled carcinoma was found in the site of a sinus which had followed a complete mastoidectomy. The growth was purulent, had eroded the petrous and squamous portions of the temporal bone, and had involved the dura; purulent adhesion of the dura to the temporo-sphenoidal lobe had resulted in the formation beneath of a cerebral abscess.

Osteomyelitis of skull.—Acute osteomyelitis of the skull was found at necropsy in 51 cases, but in no single instance could an abscess of the brain be demonstrated. Osteomyelitis of the skull, therefore, appears to be a rare cause of brain abscess.

Syphilis of the skull.—Syphilis involving the skull was found in only three cases amongst 14,534 necropsies conducted over a period of 18 years, and in these three instances cerebral abscess had not resulted. If such a combination does exist, therefore, it must be excessively rare.

(To be continued.)

SURGICAL TREATMENT OF DUODENAL ULCER.

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THE number of papers dealing with this subject which appear every year renders it strikingly evident that no completely satisfactory method of treatment has yet been evolved. That no duodenal ulcer should ever be treated by surgical measures is a belief to which few clinicians of experience now subscribe. The other extreme view—that the establishment of a positive diagnosis is an indication for surgery—is equally untenable to the logical observer who sees, on the one hand, patients with indubitable duodenal ulcer lose their symptoms permanently under medical treatment, whilst on the other he knows of many who prove quite refractory to such measures. It cannot be emphasised too strongly that, in uncomplicated duodenal ulcer, surgery should be considered in connexion with this second class of case alone. For these stubborn recalcitrant cases there are three accepted surgical operations—gastro-jejunostomy, pyloro-duodenal resection, and pyloroplasty.

The object of this paper is to record the results of my own experience, which has led me to conclude that pyloro-duodenal resection is preferable to the older and well-established operation of gastro-jejunostomy. The figures which I bring forward are based on a small number of cases. Undoubtedly in this fact resides an element of weakness. The numbers are small partly because in a university surgical unit too great specialisation is unfruitful from an education point of view, and partly because the last few years have witnessed a revival by the physicians of the alkaline treatment of gastric and duodenal ulcer, a revival which significantly shows signs of waning. Where such a complicated question as the treatment of duodenal ulcer has to be assessed, the variants are admittedly very great in number. Any accuracy gained from massed statistics is likely to be lost because very dissimilar things are accounted equal, and different standards have been applied to the several component groups. The force of this argument will be seen later.

Speaking generally, continental surgeons have been dissatisfied with gastro-jejunostomy, whilst English and American surgeons have obtained such good results that they have not been impelled to explore the value of the more radical resection methods. Thus Sherren[1] had 92 per cent. well; Walton[2] had 88·4 per cent. better; Luff, in a mass statistical investigation,[3] found 91·5 per cent. to be cured. Balfour,[4] at the Mayo Clinic in 1927, reported that of 100 doctors who had had gastro-jejunostomy performed for duodenal ulcer longer than five years, 87 per cent. were cured. In 1930 Balfour reported the results in duodenal ulcer for gastro-jejunostomy in 500 patients who had been subjected to surgery more than five years previously. He says "in 69 per cent. the relief had been either so complete that the patient had paid no attention to diet or to habits of living, or dyspepsia was so slight as to be readily controlled by simple measures." It is very striking that this is the exact percentage of cures which I reported in 1925.[5] Later on in the same paper the figure 87 per cent. again occurs as representing those who "obtained relief which they had been unable to obtain by any other means."

Comparison of Operations.

In comparing the results of gastro-jejunostomy with those of resection it is not only essential to define the term "cure" but also to utilise only series of cases treated by the same operator. In the small collection of cases reported here I have applied the word "cure" to those patients who are completely free from symptoms, do not take any precautions about diet, live normal lives, and in fact are not conscious of the process of digestion. Since I began my first assays into resection for duodenal ulcer, 122 cases have passed through my hands and been operated upon by myself. Of these, gastro-jejunostomy has been performed in 35 cases (28·7 per cent.), a Finney pyloroplasty in 2, and pyloro-duodenal resection in 85 (69·6 per cent.). That is, resection has been carried out in about 70 per cent. of patients. Gastro-jejunostomy was performed either because resection seemed impracticable owing to widespread fibrosis around, or because the ulcer was a small soft one and the larger operation appeared unjustifiable.

Mortality of gastro-jejunostomy.—Three patients died (8·5 per cent.). One was from pulmonary embolism on the seventeenth day in a man of 60. One man of 36, who had previously had a perforation and subsequent severe hæmorrhage, died within 24 hours after an anterior gastro-jejunostomy from hæmatemesis. No clamps were used at the operation, but I believe the blood to have come from the suture line. The third patient, a woman of 58 with a large callous ulcer, died on the twelfth day after operation from broncho-pneumonia. Post-mortem examinations were made in all three.

Mortality of pyloro-duodenal resection.—Amongst the 85 operations, which include the very earliest when the technique was not well understood as is the standardised operation of gastro-jejunostomy, two patients died (2·3 per cent.). The ninth resection was a woman of 47. Anterior and posterior ulcers were present. A Billroth-I anastomosis was performed. She died on the tenth day with a very rapid pulse and great pallor. A hæmorrhage was suspected, but a post-mortem examination revealed nothing but fatty degeneration of the heart. The abdominal anastomosis had healed. No signs of peritonitis were present. The other patient, the eighteenth operation of resection, was a young man of only 21 who for six years had had severe symptoms. Again a Billroth-I operation was performed to remove two duodenal ulcers. On the sixteenth day he died. Post-mortem bilateral broncho-pneumonia was present. The anastomosis had nearly healed. The length of time the operation took probably contributed to the lung complication. These are the only two deaths there have been, and since then 67 consecutive patients have had resections performed upon them without mortality.

Whilst it might not be fair to take the figure 8·5 per cent. as representing the true mortality of gastro-jejunostomy in a larger series of cases, yet it must be admitted that in the hands of the same surgeon pyloro-duodenal resection has no greater and probably a lesser mortality than gastro-jejunostomy.

Later results.—Of those patients who have been operated upon for 3½–6½ years, only 51 could be studied, for some have proved impossible to trace. Of these there are only 13 gastro-jejunostomies, of whom eight are quite well (61·5 per cent.). It must be conceded that the total number is absurdly small from which to generalise. Yet it represents my clinical impression fairly faithfully. Perhaps the figure 69 per cent. that I published some years ago, agreeing as it does with Balfour's "completely well" percentage, reflects more accurately the true state of affairs. These eight patients are absolutely well and normal individuals. Of the other five, one has only slight symptoms, one is unrelieved in any way, whilst the other three show some improvement.

The cases of duodenal resection number 38. Of these, 81·5 per cent. are absolutely well. Of the failures, mention must be made of Case 19, to whom I have referred in previous publications, for during the separation of the intestine I cut across the common bile-duct, afterwards implanting the pancreas into the open end of the duodenum. For three years he was absolutely well without symptoms, but early last year he wrote that he had had attacks of severe pain in the right side of the abdomen with jaundice. Early this year he died in another hospital. Post mortem, a gall-stone was found impacted at the entrance of the common duct into the duodenum and there was a septic cholangitis. It is not absolutely certain but probably fair to attribute the formation of gall-stones to the injury of the common duct. Of the other failures, three of the early Billroth-I operations must be mentioned in which the duodenum containing the ulcers, the pylorus, and a very small piece of stomach were removed. Case 3 had recurrence of symptoms within a year; a posterior gastro-jejunostomy has given him relief since. Case 14, a man of 49, was quite well for three years but then intractable symptoms recurred. At operation two years later a hard mass at the back of the duodenum was felt—clearly an ulcer adherent to it; an anterior gastro-jejunostomy has given him relief for the last 18 months. Case 11, a male of 43, received only temporary benefit and, although X ray investigations were twice made, no abnormality was found until four years later, when it seemed clear that he had another duodenal ulcer. This was confirmed during the performance of an anterior gastro-jejunostomy. Two months after this he perforated a gastro-jejunal ulcer. Since that time, over two years ago, he has had another perforation which he has survived. He still complains.

Deductions.

This experience corroborates that of other surgeons that, like the analogous case of the gastric ulcer, local removal is insufficient. It is necessary to take away a certain portion of the stomach as well. But even this will not certainly protect every patient from recurrent ulcer, though such an ulcer is excessively rare. Jansen[6] found in the literature 21 cases of ulcer after a Billroth-I operation: 11 of them occurred in the suture line and 10 in the duodenum. An analysis showed that most of them were due to insufficient antral resection or injury to the pancreas. A few seemed to be ulcers overlooked.

Although more recurrent ulcers have been reported after the Billroth-II operation, I have not had one in my own series, probably because more of the antrum is taken away than in the small Billroth-I resection done in my earlier cases. However, a man of 45 came under my observation who two years before had had a posterior gastro-jejunostomy for a duodenal ulcer. No relief occurred, so the pylorus was resected eight months later. Four months after this an extensive Polya resection was performed for a gastro-jejunal ulcer. Less than a year later he came under my care. He was emaciated and evidently had a large gastro-colic fistula, with fæcal vomiting and diarrhœa. At operation I was quite unable to remedy this, as the marginal ulceration had been so extensive as to lay the stomach and colon into one cavity. He died six weeks later.

No operation will cure every patient with a duodenal ulcer. Of those sufferers whose complaint is unrelieved by medical treatment 69 per cent. will be cured by gastro-jejunostomy and 81 per cent. by gastro-duodenal resection. In the face of these results I feel constrained to continue to perform gastro-duodenal resections, particularly as my figures include all the early operations where the technique was not clearly worked out and the extent of the removal necessary was unknown.

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DIVIDED DOSAGE IN RADIUM THERAPY.

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AND

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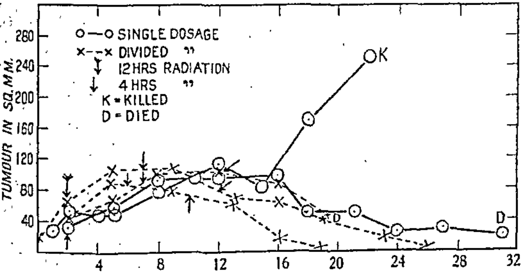
THE dose of radiation required to produce an erythema of the skin cannot be expressed in milligramme-hours even when the screening, the distance, and the area of the applicator are kept constant, for the reason that fewer milligramme-hours will be required to produce an erythema when the intensity of the radiation is high than when it is low. When the intensity be reduced to a few milligrammes per square centimetre, exposures extending over several weeks will not produce an erythema. Similar results are obtained using a strong applicator by giving a number of small doses once a day or once a week. For instance, a square applicator of 60 mg. of radium spread over 4 sq. cm. and screened by 0·12 mm. of silver and 3 mm. of lead, and lead plaster (this applicator was used throughout these investigations) gives an erythema if laid on a rat's skin for 12 hours (720 mg. hours). When, however, exposures of five hours were given once a week, 13 such exposures were required to produce an erythema (3900 mg.-hours).

The Table, giving skin reactions, shows the difference *between single and divided dosage. It may be* inferred that the skin recovers from the injurious effects of the radiation between the intervals of the divided exposures, whereas during the continuous exposures there is no such opportunity for this power of recovery. The question arises, do tumours also show this power to withstand *divided dosage?*

FIG. 1.



In this and subsequent figures the number of days refers to the periods following appearance of tumours after inoculation.

SINGLE DOSES.					DIVIDED DOSES.				
Hours.	E.	M.S.	H.O.	H.G.	*3 appls. of 5 hrs. at 3 day intervals.*				
11 ..	N	N	N	N	1	N	N	21	29
12 ..	N	N	22	32	2	N	N	25	31
13 ..	15	N	21	32	3	N	N	24	27
14 ..	13	N	16	34	4	N	N	24	30
15 ..	10	N	20	27	*3 appls. of 4 hrs. at 3 day intervals.*				
15 ..	10	13	24	27	1	N	N	N	N
15 ..	?	14	20	30	2	N	N	N	N
					3	N	N	N	N

E. = erythema; M.S. = the occurrence of a moist surface; H.O. = hair out; H.G. = hair growing. The figures give the number of days after exposure (the first exposure in the case of the divided doses) on which erythema, hair out, &c., occurred. N indicates no skin reaction.

Regaud and Ferroux[1] have recently shown that whereas 4000–4500 R damages the skin over the testes of rats, and at the same time does not cause complete sterility, *5000 R* given in repeated small doses does not damage the skin, whilst complete sterility follows. Assuming that tumours will behave like the testes and present a low power of recovery, they recommend fractional dosage in radiotherapy in order to avoid damage to the skin and surrounding normal tissues.

The following experiments have been carried out to see how Jensen's rat sarcoma responds to divided dosage. Two tumours were taken of 60 sq. mm. One of these was given 15 hours Y-radiation to the radium applicator already described, the other three exposures of five hours at intervals of two days. Both tumours disappeared at approximately the same time.

Three tumours of about 20 sq. mm. were similarly dealt with. The tumour receiving the divided dosage disappeared more quickly than the two receiving the single 15-hour exposure. In Fig. 1 five tumours are dealt with. The times of radiation were 12 hours and three periods of four hours, the tumours were from 40–50 sq. mm. in area when first radiated.

FIG. 2.

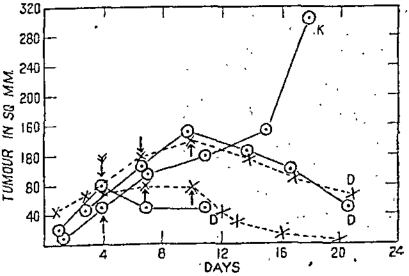
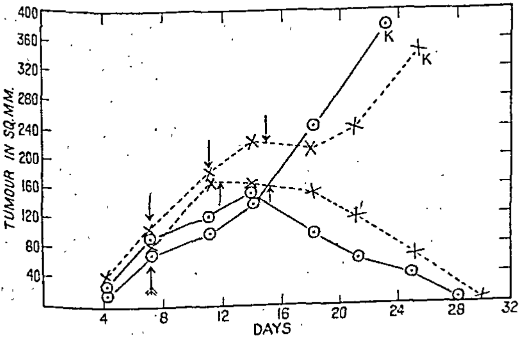


Fig. 1 shows that one of the tumours, given 12 hours, did not disappear, but after a period of retarded growth developed into a large *tumour; the other* 12-hour radiated tumour persisted for a longer period than any of the tumours which had the divided exposures. It follows that exposures of three periods of four hours at from four to five days' intervals were rather more efficient than single exposures of 12 hours in causing the tumours to regress. Fig. 2 deals with tumours which were first radiated when from 50–70 sq. mm. in area. Three were given 12 hours, and two divided dosage. *It is seen that one of the* tumours receiving 12 hours grew, otherwise there was no decided difference between the effects of a single dose and of divided dosage. Fig. 3 deals similarly with tumours from 80–92 sq. mm. in area. Here again the divided dosage is just as efficient

FIG. 3.



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[1] Regaud, Cl., and Ferroux, R.: Zeit. f. Krebsforsch., 1930, xxxii., 10.

as the single dose in causing the disappearance of the tumours.

It is concluded, therefore, that Jensen's rat-sarcoma is just as sensitive to divided dosage as to a single dose within the limits of the above experiments; and that irradiating this tumour with a view to causing its disappearance, and at the same time avoiding injury to the overlying skin and normal tissues, can be accomplished more successfully by divided dosage than by a single exposure. It is clear that a much larger dose of radiation can be set free in a tumour without the production of an erythema of the skin by divided dosage than by a single exposure, and that this larger dose will have its full effect on the tumour, since its power to recover in the intervals between exposure is much less than in the case of the skin. These results strongly suggest that in the external application of radium or X rays in the treatment of tumours, divided dosage should be given a thorough trial. How much the dose should be divided and what should be the intervals of time will probably depend upon the growth rate of the tumour and on its kind, only by clinical research can this be discovered.

CLINICAL AND LABORATORY NOTES

A CASE ILLUSTRATING THE COEXISTENCE OF THE ARTHRITIC AND ALIMENTARY FORMS OF PURPURA.

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It is well authenticated that both the forms of the anaphylactoid type of purpura may occur in the same patient. The following case, however, presents several points of clinical interest.

A girl, aged 11½ years, who had always been an exceptionally healthy child, was admitted to the Hospital for Sick Children under the care of Dr. Robert Hutchison on March 25th, 1931. She had, for six days, complained of frontal headache, of a sore-throat, and of pains in the arms and legs which had lately become more severe. On the day before admission she had vomited once.

Examination showed some swelling and pain on movement of the right elbow, of the left wrist, and of both knees. No cardiac abnormality was detected. A tentative diagnosis of acute rheumatism was made, but, on the next day, a few purpuric spots appeared on the right forearm and over both knees. The probability of the case being one of purpura arthritica was then recognised. This probability was strengthened by the facts that the platelet count was 129,600 per c.mm., that the coagulation time was 1 min. 25 secs., and that the bleeding time was 30 secs. After the first day in hospital there was no fever, and the pulse-rate remained around 120 per minute.

Vomiting was a prominent feature, two or three vomits taking place every 24 hours. On April 1st some gastric peristalsis was noticed through the very thin abdominal wall. Next day a fæculent vomit occurred. No further peristalsis was seen and a copious result was obtained after giving an enema. During the night there were two further vomits, fæcal in character, and the child became obviously more ill. Although a second enema gave a good result, the diagnosis of a high obstruction, probably due to an intussusception, was made, and laparotomy determined upon. There was no abdominal distension, but the condition of the child was critical. A blood transfusion was therefore given before the operation. A jejuno-jejunal intussusception about 4 inches in length was found. It was of apparently recent origin, and was successfully reduced. A great amount of free fluid, yellowish and slightly blood-stained, was found in the peritoneal cavity. It was proved, by subsequent culture, to be sterile. The appendix was normal, but in the intestinal wall, for its entire length, though especially numerous in the ileo-cæcal region, were many obvious sub-serous hæmorrhages, some frankly purpuric, and others circular. The whole presented a very striking picture.

After the operation progress was satisfactory, despite the appearance of some further purpuric spots on the wrists ten days later. These were transient, and convalescence has since been uninterrupted.

One of the most interesting features of the case lies in the differential diagnosis of the cause of the vomiting. This, it appears, was at first consequent upon the hæmorrhages into the wall of the gut. The later vomiting, which was fæcal, was determined by the intussusception. Another point of importance lies in the fact that, whilst it is generally taught that the diagnosis of intussusception should not be made without first attempting to exclude the presence of Henoch's purpura, yet in this patient intussusception and the abdominal type of purpura were found to coexist. Indeed, the intussusception was probably the result of a patch of bleeding into the intestinal wall.

Our thanks are due to Dr. Robert Hutchison for permission to publish this case.

SILICOSIS IN A GRAVE-DIGGER.

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The patient was a man, aged 32, who had worked as a grave-digger for the last 17 years. In 1924 he began occasional blood-spitting. There was cough and shortness of breath. In 1926 he had pleurisy, side unknown. In November, 1929, the symptoms were worse, night sweats, weight loss, and malaise supervened. In March, 1930, his doctor diagnosed bronchitis. The patient was dissatisfied, and in April, 1930, had a radiogram taken and was told he had lung fibrosis. Despite his symptoms he continued at work until October, 1930, when he was admitted to the Cheshire Joint Sanatorium gravely cachectic, with low blood pressure 75–112, and much emaciation. The symptoms were heavy cough, copious sputum, and marked dyspnœa. The sedimentation-rate was rapid. The sputum contained tubercle bacilli. The temperature was high. The chest expanded one inch. The right chest was dull, the breath sounds were weak, and there were some râles throughout and evidence of a cavity at the apex. The left lung had a moderate dull note, harsh breath sounds, and very few adventitia. The X ray screen showed that the diaphragms moved very slightly and that the diaphragmatic angles opened up poorly. The radiogram I considered to show advanced tuberculosis and pneumoconiosis. The patient died in 66 days.

Autopsy.—The pleuræ were thick and adherent at many points. The lungs felt gritty and had numerous cavities. The mediastinal glands were enlarged. Two sections of the lung were prepared by the freezing method and one by paraffin. One pathologist reported that the sections showed ordinary structure of chronic pulmonary tuberculosis, adding that the fibrotic nodules present had caseous centres and were therefore certainly old tubercles, and that "there is no evidence of fibrosis or of fibrotic nodules such as are found in silicosis. Thereafter, this pathologist said there was disagreement amongst other pathologists who had seen the slides. I therefore submitted the history, the radiograms, and the microscopical slides to Prof. Lyle Cummins, who has kindly reported as follows:—

> "The sections I have examined with much interest. To me they appear to be typical of silico-tuberculosis. Some of the lesions are fairly typical of what Irvine has called 'infective' silicosis, and others are those of a very fibrotic type of tuberculosis."

It is noteworthy that for 17 years the patient had worked as a grave-digger. Samples of the sand from the graves were found to be ordinary red sandstone. The man told me that the graves varied in depth from 7 to 13 feet, and that pneumatic drills were often employed and, though the patient knew nothing of silicosis, he considered his work very dusty, and in dry weather he and his colleagues were only able to dig for periods of 20 minutes. Pathologically and clinically the case appeared to me to be obviously one of tuberculosis and pneumoconiosis and, in view of the nature of the sandstone, probably silicosis.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE.

SECTION OF THERAPEUTICS AND PHARMACOLOGY.

A MEETING of this section was held at Cambridge on May 30th, with Dr. PHILIP HAMILL in the chair. A paper on the

Action of Avertin on the Liver

was read by Dr. E. B. PARSONS. This drug was, he said, an organic compound of bromine and such compounds were known to have a toxic action on the liver. He had attempted to study the effect of Avertin in rabbits by staining their livers for fat after varying doses of the drug. The interpretation of the findings had been difficult because of the accumulation of glycogen which tended to mask any pathological changes that might be present. He had, however, been able to demonstrate slight fatty degeneration after doses of 0·5 g. per kg. of body-weight. He did not claim that these experiments were in any way conclusive and he hoped to be able to repeat them in dogs where interpretation would be easier.

Sir FRANCIS SHIPWAY said he had now used avertin in 435 cases, including children and old people, without any bad results. In 12 of the patients the operation had been for removal of the gall-bladder, and in one case congenital cystic disease of the liver was present and there was comparatively little healthy liver tissue left. All had made a good recovery.

Sir WILLIAM WILLCOX said it was not yet known to what extent avertin was a liver poison, although it was known that bromine compounds were more toxic than the corresponding chlorine ones. It was very important to remember the part played by idiosyncrasy when drugs caused toxic damage to the liver. Atophan was a good example of this.

Cerebral Metabolism.

Dr. E. G. HOLMES read a paper on Cerebral Metabolism (by himself and Mr. C. A. Ashford). He pointed out that in order to understand the mode of action of drugs on the nervous system—*for example*, those causing anæsthesia and analgesia—a knowledge of the biochemical and physiological processes in the brain would be of great value. The present investigation arose from a desire to know whether during insulin convulsions there was any shortage of sugar in the brain. It was found that in an animal killed during insulin convulsions the glycogen and sugar content of the brain were not reduced but there was less lactic acid than normal present. It was found on further experiment that the lactic acid content of the brain was proportional to the glucose content of the blood when the animal was killed. The brain only had very small stores of glycogen and was mainly dependent on the glucose brought to it in the blood. The convulsions of hypoglycæmia were not relieved by lactic acid but were relieved by glucose, so it seemed that the conversion of glucose to lactic acid was one of the essential processes of brain activity. Dr. Holmes went on to discuss the differences between brain and muscle metabolism which his experiments showed were striking. In brain tissue, for example, there was no hexose phosphate stage in the formation of lactic acid and the rate of oxidation processes was much more rapid in all nervous tissues, being greatest in grey matter and least in nerve. He said that they had also carried out a few experiments on non-medullated nerve which seemed to show that here again metabolism was quite different, since plenty of glycogen was available. He thought that work on these lines was a necessary preliminary to an understanding of what was happening in the central nervous system, and was essential if the way in which it was affected by drugs was to be understood.

Digitalis in Toxæmia.

Dr. G. N. MYERS read a paper in which he said that the difference of opinion among clinicians about the value of digitalis in pneumonia had led him to test its action in toxæmia. The toxin used in these experiments was diphtheria toxin, and the experimental animals were guinea-pigs. A series were digitalised for varying periods and doses varying from one to three minimum lethal doses of diphtheria toxin were given. Nearly all the digitalised guinea-pigs survived and the controls died. Survival was found to depend on two factors—the dosage of digitalis and the amount of toxin injected. The toxin was next given first and the digitalis second, and it was found that the digitalised animals again survived provided that administration of digitalis was begun at once.

Strophanthus was found to have the same protective effect to a less marked degree. Ouabain, however, was found to have no protective effect at all. When the reaction of the white cells was examined it was found that there was much greater leucocytosis in the digitalised animals than in the controls. The differential count showed an absolute and relative increase in lymphocytes and the polymorphonuclears remained normal. The injection of nucleoprotein was found to affect the leucocytes in the same way but there was no protective effect. Examination of the cardiac muscle in the controls showed typical fatty degeneration, whereas the hearts of the survivors among the digitalised animals showed very little.

Dr. W. E. DIXON said that whatever the action of digitalis might be it was certainly different from that at present taught to students. It was probable that it had some physical effect on tissues which prevented toxin from acting.—Sir WILLIAM WILLCOX asked if digitalin had been tried in these experiments. —Dr. MYERS replied that it had not.

Sir HUMPHRY ROLLESTON recalled the observation that digitalis had a beneficial effect on alcoholic delirium.

Dr. HELLIER read a paper entitled

Sensitisation of the Uterus.

Pituitrin, he said, had been shown to have a more powerful action on the uterus than any other substance, but it was not yet clear how far it was responsible for the onset of normal labour. Dixon and Marshall had suggested that this was due to increased secretion of pituitrin at the end of pregnancy; other observers had suggested that œstrin was the sensitising agent. Using the guinea-pig uterus, Dr. Hellier showed that œstrin had no sensitising effect provided that a preparation free from protein was used; the results previously obtained might be due to protein rather than to œstrin. He then produced evidence to show that the factor of importance is the relative proportion of potassium to calcium salts in the fluids perfusing the uterus, and suggested that if potassium is increased relatively to calcium the uterus is sensitised to pituitrin. There was evidence, he said, to show that this was actually the case in pregnancy, and this might be the normal physiological process for the induction of labour.

Dr. DIXON said that œstrin was a hormone of comparatively simple chemical composition which had one known property, that of causing the return of the œstral cycle after spaying. Dr. Hellier's paper supported the view that œstrin has nothing to do with sensitising the uterus.

Histamine and the Circulation.

Dr. J. C. HOYLE read a paper in which he said that histamine could rapidly produce in experimental animals a condition resembling surgical shock. Very little work had, however, been done to show its effect on the pulmonary circulation and deductions from experiments carried out on one species of animal were of little value because the effect varied greatly in different species. His tracings showed that in the dog intravenous injection causes first a short preliminary stage in which the right auricular pressure rises, the pulmonary arterial pressure rises, and the vascular volume of the lung is increased; this is then followed by a longer stage in which these conditions are exactly reversed. Other tracings showed the variations produced in the dog, the cat, and the monkey. He suggested that the preliminary effect was due to the local action of the drug on the pulmonary vessels and heart; it was then carried round in the blood stream to the portal circulation where it produced a spasm of the vessels and therefore a damming-back of the blood which was the cause of the secondary effect on the pulmonary circulation.

THE INTER-STATE POST-GRADUATE ASSEMBLY OF NORTH AMERICA.

(Continued from p. 1194.)

AT the second session of this association, held on May 27th, Mr. LAWRENCE ABEL gave a cinematographic demonstration of the abdominoperineal operation for

Cancer of the Rectum.

It was important, he said, to know how to estimate the patient's chances of surviving the operation. Before coming to a decision a number of investigations should be made. The heart and lungs must be investigated in the usual way, and the cardiac energy index should be estimated, this being represented by the formula: $\text{C.I.} = \frac{\text{P.P.}}{\text{D.P.}} \times 100$. P.P., the pulse pressure, was obtained by subtracting the diastolic pressure from the systolic pressure. Any patient with a cardiac index between 25 and 75 was a good subject for operation, but over 75 the risk became serious. Any patient with a hæmoglobin percentage of less than 50, or a red cell count of less than four million, should have a blood transfusion before operation. The blood-urea should be estimated and the blood group ascertained. It was useful also to have an estimation of the blood chloride and blood cholesterol. The urine was studied by the usual tests, and by culture from a catheter specimen. In Mr. Abel's experience two-thirds of the patients who came up for advice were beyond all hope of help from surgery, but 33 per cent. were operable.

The abdominoperineal operation, he said, was the only thorough procedure, and it was fraught with less danger to the patient than any other. The abdominal portion was practically bloodless; the perineal portion demanded careful hæmostasis. The whole operation took about an hour. The complete abandonment of chloroform and the introduction of the McKesson gas and oxygen apparatus had done much to reduce mortality. After the operation it was very important to move the patient straight on to his bed in the theatre, to keep him warm by an electrically heated blanket, and to give him a blood transfusion at once. The mortality had fallen to 7·6 per cent. since the introduction of this transfusion. If a perineal excision could be performed, an abdominoperineal could certainly be performed; 77 per cent. of patients were alive and well five years afterwards. Colloid and melanotic growths had 100 per cent. mortality; operations for cauliflower growths were nearly 100 per cent. successful, while those for adenocarcinomata ranged between 60 and 70 per cent. The patients never had any trouble with the action of the colostomy opening; they had very rare accidents, if any, and needed no aperients. At the end of three months they went back to work, or any sport they liked—hunting or golf. Women had borne children after the operation. The prognosis seemed to be worse with young people.

Cancer of the Cervix.

Mr. VICTOR BONNEY gave a gynæcological talk. In answer to questions he began by describing his method of treating cancer of the cervix. The best radium workers, he said, had had 25 five-year cures among every 100 cases. The best surgical results were the same, but the surgeon's 25 cures really came from 65 cases, as that was the operability rate. The radium man treated 96 per cent. of the cases sent to him. The surgeon treated 40 more of his 100 cases with radium and got a certain number of cures in addition to his 25 operative successes. Even with Heyman's technique the results of radium at the Middlesex Hospital had been poor; admittedly it was only used for inoperable cases. Another objection to radium was that it could not be used without letting the patients know they had cancer; most of the surgeon's patients never knew. He did not use radium pre-operatively because it confused the issue. The mortality of Wertheim's operation had been immensely reduced—to 5 per cent. The operation was one that any surgeon could do, but it must be learned thoroughly. Radium could not remove the glands or the tissues on the side wall of the pelvis. The vaginal operation suffered from the same disadvantage. To compare radium and surgery was like comparing a trench-mortar with a high-velocity gun; their spheres of action were totally different. The method of election depended on the shape of the cancer area; the area of radium influence was limited, while that of surgery could be extended where necessary. Since the action-area of radium was essentially smaller than that of surgery, radium was best suited for early growths. The extent of a growth was relative to the size of the cervix; a growth would soon grow outside the limits of a small cervix.

FIBROIDS AND PROLAPSE.

He had a very poor opinion of the use of radium for fibroids. It induced an artificial menopause and atrophied the ovaries. The same thing could be done more safely with X rays. The operation was so simple and safe that it was hardly worth while to recommend even X rays. It was a retrograde step to destroy the ovaries for a bad uterus. The ideal treatment was myomectomy; it was never necessary to remove the uterus. He had removed as many as 125 fibroids from one uterus by the method of block incision.[1] The first step was to clamp both uterine arteries in the myomectomy clamp and both ovarians by ring-forceps on the ovariopelvic ligament. Then the uterus was split right down the centre from the fundus. With one finger in each cornu, a wedge was marked out on each half with the scalpel and taken right out, many of the fibroids going with it. The remaining fibroids were easy to shell out from the cut surface, and the two halves of the uterus were then united. The one drawback was the stitch line down the back of the uterus, which involved a mild risk of adhesion to the small intestine. Most myomectomies could be done entirely from the front. The whole essence of the operation was hæmostasis. Patients did very well in subsequent pregnancies. The uterus stood labour quite well, but the patient often preferred Cæsarean section to ensure the safety of the baby, as such a patient was naturally often near her menopause by the time her child was born.

Prolapse was a very variable thing with many lines of treatment, but, speaking generally, Mr. Bonney preferred Blair Bell's buttress method of anterior colporrhaphy. For the rare form—true hernia of Douglas's pouch—he had various methods: an ordinary colpoperineorrhaphy as for rectocele might be successful, but in some cases he had opened the abdomen. Vault prolapse could be remedied by amputation of the cervix and colporrhaphy, but ventrifixation was safer and surer unless the cervix had to come out anyway.

Retroversion of the vagina was very common, though never described in text-books. There was no redundance in the anterior wall, though far more than usual of the anterior wall of the vagina was seen through the orifice. Often the uterus was held up—retroposed, not retroverted—but often it went back too. The result was that the intestines lay in front of the uterus, on the bladder; the whole direction of pressure was changed. Instead of bringing pressure to bear on the rectum in defæcation, the intestines pushed back the uterus. Only ventrifixation would antevert the vagina. For elderly people with complete prolapse Lefort's operation was excellent.

MEDICO-LEGAL SOCIETY.

Sir WILLIAM WILLCOX presided at a meeting of this society held on May 28th, and Dr. NATHAN RAW read a paper on

Dangerous Drugs.

The League of Nations Council, he said, had coördinated national efforts to prevent the illicit manufacture and distribution of narcotic drugs, and the Dangerous Drugs Act, 1920, was the contribution of Great Britain to this work. The Regulations of 1928 scheduled medicinal opium; extracts and tinctures of Indian hemp, cocaine and ecgonine and their salts; morphine and its salts diacetyl-morphine (heroin), eucodal and dicodide; and any preparation or other substance containing one-fifth per cent. or more of morphia or one-tenth per cent. or more of cocaine or ecgonine; and some others. These drugs could all be obtained on the prescriptions of doctors but not otherwise, and careful records must be kept and be open to inspection.

The illicit drug traffic was enormously lucrative and the unlawful supply of dangerous drugs was very large. A great deal of opium was smuggled into Cairo from the Red Sea by nomad Arabs who made this activity their chief means of livelihood. The men at the head of the organisation were Greeks, who must have made colossal fortunes out of it. Once in Cairo, the opium, cleverly adulterated, was parcelled out among the pedlars who sold it in the coffee-houses, or transported it in bulk to one of the opium dens in the Mouski bazaar. Generally speaking, the opium traffic had been stamped out of Europe, with the possible exceptions of Berlin and Constantinople. The latter town contained three factories, two of which turned out opium and heroin at the rate of one ton per month. The normal wholesale price of opium and cocaine was, he said, about £25 per kilogramme. They were never sold in Western Europe to an addict at less than a shilling a "shot" of about 20 mg., and the drug was as a rule heavily adulterated in the first place; the profit, therefore, was usually far in excess of 1000 per cent. The "Byng broom" had swept away most of the West End night clubs which had been used by addicts and pedlars, but similar resorts were springing up in the outlying districts. The machine-gunners of the American criminal gangs were nearly all cocaine addicts. Cocaine- and heroin-taking owed their growth to the war. Wounded men had developed a craving for drugs; hospital staffs had taken to them in their world of horror, and a large synthetic production had developed to meet the demand. Germany, which had made much synthetic cocaine and heroin during the war, was a prolific source of supply, with Switzerland in second place. Much of the increase was due to curiosity and a sensuous craving for something new; to lack of hope, recklessness, neurasthenia, and the necessity to maintain the pace at work and to seek refuge from a jarring world. Moreover, young women found that "sniffing" gave them brightness and vividness.

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[1] See THE LANCET, Jan. 24th, p. 171.

An international conference on the limitation of the manufacture of narcotic drugs was at present in session at Geneva, to agree if possible on amendments of the Geneva Convention of 1925 and to limit the derivatives of opium and coca leaves to strictly medical uses, as contemplated by Article 9 of The Hague Opium Convention of 1912. A pamphlet published by the secretariat of the League of Nations showed how failure to ratify or carry out the Geneva Convention had led to an alarming increase of the illicit drug traffic. The only effective weapon against this traffic would be combined international effort. Nevertheless, this country could be proud of the fact that its share in the traffic was comparatively small.

Sir William Collins related that Lord Brassey's Commission in 1895 had given the impression that opium, at any rate in India, was rather a good thing than a bad, and that the Indian opium trade with China was indispensable. John Morley—as he had then been—had overthrown that position and an attempt had been made to bring the Indo-Chinese opium trade to an end, but it had failed in 1917. While it had been in progress, England had been exporting large quantities of morphia to India and the Far East, but this traffic had decreased. The only way to control the spread of dangerous drugs was to draw a ring round Turkey, Persia, and China. The work of the present conference seemed to be largely invalidated by the omission of any attempt to control raw opium and raw coca. The American and the Chinese delegates had withdrawn from the conference in 1925 because no account was being taken of raw material. There was strong opposition in India to any legislation parallel to the Dangerous Drugs Act, although the British signatories to The Hague Convention had accepted responsibility for the Crown Colonies and the Dominions as well as for the Home Country. India's large export of opium to the Far East would not be forgotten at Geneva.

Aspirin and Thyroid.

Dr. Gerald Slot remarked that practising physicians also encountered the problem of addiction to hypnotics of the barbituric acid series, to thyroid preparations, and to the aspirin group. Drugs of the barbituric acid series did not bring about the same moral and physical degradation as opium and cocaine, but they were none the less very harmful. Thyroid was often taken by women who wished to get thin, and its addicts took it in enormous doses. One girl he had attended had developed argyria from the silver coating of the pills, besides the symptoms of tachycardia and swollen feet; she had been taking grs. 70 of thyroid a day. It was not uncommon to see women eat aspirin out of their handbags as though it was so much sugar. Again, although ergot-like preparations had been put on the Dangerous Drugs list, many ecbolics equally powerful or more so could be bought without restriction, such as pituitary extract and pennyroyal. The sale of drugs such as lysol and arsenic from automatic machines also constituted a great danger.

Mr. H. N. Linstead stated that chemists in some of the middle European countries produced drugs which, although not dangerous drugs, were chemically very close to them and could be easily changed into them. These basic products could be manufactured and sold without restriction. Only a Government monopoly would check this evil. Six months ago, he said, the Turkish Government had agreed to control the three factories in Stamboul which were manufacturing morphine and heroin. The amount of opium grown in India had been cut down steadily.

Dr. E. H. Griffin recalled that in the war he had purchased "paradise pills" from an Italian and had derived great benefit from them at a time when he had been sleepless. The dangerous drug menace was probably not so serious as the alcohol menace. Drug patients were invariably nice people, well turned out and well-behaved—a great contrast to alcoholics. The replacement of opium by alcohol in China had done the population great harm. We complained of a few grains of morphia from Turkey, but we dumped large quantities of whisky on the Americans.

Dr. Morgan Finucane said that, unlike most legislation, which was drafted as the result of careful inquiry, the Dangerous Drugs Act and its strict regulations had been based on hasty war legislation in America and hurriedly adopted here, chiefly because of a few notorious cases. Morphia and heroin were a great sheet anchor in chronic illness, but doctors became obsessed by the idea that they could not give them, especially to poor patients. It was quite wrong to restrict the liberty of the doctor as the Act restricted it.

Dr. Percy Spurgin pointed out that, whereas medical men now tended to restrict the giving of drugs of any kind, the sale of patent medicines had enormously increased, among them being drugs quite as dangerous as morphia and heroin if taken in the wrong way.

Mr. E. R. Bolton maintained that he had never found that the Dangerous Drugs Act had ever prevented anyone from obtaining the drugs he wanted for scientific or medical purposes.

Mr. A. A. Romain pointed out that medical men looked upon an addict as a diseased person, but the law knew no other remedy than prosecution and imprisonment.

Mr. F. D. Levy stated that in a recent case one of the girl witnesses had said that she had not known it was wrong to take these drugs. This ignorance was very widespread. He asked why the medical profession did not band together to inform the public of the law on dangerous drugs.

Sir Bernard Spilsbury suggested that, if imprisonment had the effect of curing an addiction, it might be worth while. The number of addicts in this country had greatly decreased since the Dangerous *Drugs Act.*

Mr. E. L. Turnbull said that the Home Office only did what Parliament told them to, and that to accuse them of being bureaucratic or maniacal about dangerous drugs was quite unjust. He suggested that much addiction was due to the actual repressive effect of the Act, and that if it were repealed the gain might exceed the loss.

Sir William Willcox said that this country might pride itself on taking the lead in what was an international problem.

Dr. Nathan Raw briefly replied.

MEDICAL WOMEN'S FEDERATION.

AT a meeting of the London Association of this Federation, held on May 19th, the President, Dr. LETITIA FAIRFIELD, being in the chair, Dr. MARY BARKAS spoke on the

Voluntary Mental Patient.

The main thing in the new Act about voluntary patients, she said, was that provision for their treatment was not compulsory on the local authority. Even a statutory duty was often neglected by local authorities, so that there was not likely to be any great hurry to take up a permissive activity. Unless somebody pushed the local authorities they would do nothing, and it was extremely important for all practitioners to look out for cases requiring such treatment and to see that the local authority made provision for them. Further, the Act now gave the local authority power to spend money on out-patient departments, preventive measures, research, and after-care. Again, it was the duty of practitioners to see that the money was spent.

A good deal of the hopelessness often felt about mental patients was due to the fact that they were not treated until the most favourable period for treatment had passed. Those who had worked in institutions where voluntary boarders had been taken for some time had a more optimistic outlook. If the surgeon never saw a cancer case until three years after hope of successful treatment was over, and moreover had to live with those patients until they died, he would not feel he was getting the best chance. The general practitioner should be as ashamed of letting a mental case go beyond the curable stage as of letting a case of cancer become inoperable. How far the proportion of voluntary patients increased in public hospitals depended largely on the general practitioner, who needed a great deal more insight into the personality of his mental patients. He was in a unique position for learning all about them and for catching them in an early stage. Far too many practitioners told their patients to pull themselves together when they needed to be put to bed. "Make an effort, Mrs. Dombey" was the tragedy of many mental patients.

All that voluntary patients had to do was to write to the medical superintendent and ask for admission; they could leave on giving three days' notice in writing, thus allowing time for communication with relatives and for making arrangements. The medical superintendent had to see that the patient understood these conditions; often a doctor would send up as "voluntary" a patient who was incapable of appreciating the situation. If the voluntary patient lost volition and remained without it for a month, he must be put on some other footing. In recent years the attitude of the Board of Control had altered very considerably; they now wanted a patient to be on a voluntary basis if possible—provided only that he could understand his position. It was surprising to what extent really insane people would come as voluntary patients.

SOME TYPES.

Nearly every type of mental illness could be found among voluntary patients—even acute mania and paranoia. Far more patients with delusions of persecution could be cured if they were taken in time; their delusions developed very slowly and they did not generally reach a mental hospital for 10 or 12 years after their first complaint. They came up for advice about headache or rheumatism or some other ailment apparently irrelevant to their mental state and the general practitioner should look out for them, by inquiring of patients whether they thought there was any adverse influence affecting their health. The melancholic—the patient who got depressed and felt he was no good—was very suitable as a voluntary patient. Far too often these patients were treated vaguely by the general practitioner and urged to make an effort—until at last they committed suicide—whereas the first thing taught them in a mental hospital was to go to bed at once and stop making an effort as soon as this black cloud of dullness, absence of feeling, and insomnia came down on them. The difficulty was to select those melancholics who were best treated as voluntary patients. Some of them found it very difficult to make any decision, and a decision to enter a mental hospital and stay there was beyond them. They constantly gave notice and withdrew it, and the ensuing worry prevented them from getting the needed rest. They were depressed, retarded, and full of guilt, and could usually be certified. When the decision was taken out of their hands they settled down and got better. It would have been an advantage, in Dr. Barkas's opinion, if the Act had provided that a voluntary patient, having once signed a request to enter a mental hospital, could be detained for a few months.

Another type of possible voluntary patient was the neurotic. Many of these would be seen in the new out-patient departments and in-patient provision for them was greatly needed. Whereas those in the psychotic group needed all the resources of the mental hospital, at any rate in reserve, the neurotics often needed no more than removal from home and an occasional talk, or a rest in the open air with massage, feeding up, and, above all, a little understanding affection. Many people resented the idea that these patients should come under the Board of Control, but the smaller homes might be very unsatisfactory if under no supervision. The neurotic was particularly liable to become the victim of the quack.

If general hospitals made suitable provision for voluntary mental patients neurotic patients would get the advantage of thorough physical investigation. The general hospitals were, however, short of beds, and their help would not go far. An out-patient department was essential for the neurotic and voluntary class of patient.

In reply to questions, Dr. Barkas said that the treatment of early paranoia in institutions depended on the employment of sufficient staff. Many early cases of schizophrenia and other mental illness were much better treated outside a mental hospital, and some other provision was needed for them. They needed both psychological and physical treatment—exercises and massage, for instance—and they tended, when once they got into hospital, to relapse into "just sitting." They might do well with out-patient treatment in their own homes. Some kind of social worker was absolutely essential; at least 50 per cent. of the treatment of the patient was treatment of the family.

DISCUSSION.

The CHAIRMAN pointed out that the clause relating to temporary patients had been so whittled down in its course through Parliament that it was very difficult to interpret. It was extremely rare for any patient, not hopelessly insane, to remain without volition for a month.

Dr. MILDRED CREAK emphasised the number of cases of mild melancholia treated devotedly by the practitioner, up to the day of their suicide, as neurasthenia. The practitioner's attempts at distraction were comparable to taking a patient with a broken thigh folk-dancing. She questioned whether the anxiety of the legislator to safeguard personal liberty was really in the interest of the patient.

The CHAIRMAN observed that mild and transient psychoses were far more common than was recognised. Lay people still tended to think of mental illness as a thing apart, and took any attempt to deal with it as an insult. Coroners were ready enough to attach blame to the medical profession for any slight error in physical treatment, but never mentioned the gross maltreatment of melancholia; they did not realise how easy it was to recognise early symptoms. One early manifestation sometimes encountered was extreme resistance to treatment of any kind: "I am unworthy of medical attention." The paranoiac above all other people could be moved by self-interest and could be induced to enter a mental hospital if persuaded that it was to his advantage to do so. The public mind must be disabused of the idea that the early and the voluntary patient were necessarily curable. The voluntary provision was going to be of the utmost benefit and comfort to the chronic relapsed patient. An out-patient department without in-patient beds was a useless thing. The out-patient department attached to the big general hospital and teaching school would, in her view, prove a delusion. Nor could the work depend on voluntary social service; it was astonishing that the Board of Control had not issued a warning against instituting any treatment without trained social workers.

REPLY.

Dr. BARKAS did not agree that an out-patient department without beds was useless. It might be valuable if it had attached to it some kind of occupational centre or hostel and a convalescent home. An apparently genuine neurotic might suddenly slip over into an acutely psychotic phase; it was therefore difficult to draw a hard-and-fast line between those who needed mental hospital treatment and those who could be safely treated outside. A good convalescent villa in a mental hospital was probably the best place to treat them. Every melancholic should be regarded as a potential suicide, and yet at the same time a certain amount of risk must be taken.

NEW INVENTIONS

A PNEUMOTHORAX APPARATUS.

This apparatus, which we have design[illegible] structed, is very simple to operate a[illegible]nt. to read, and can be used without [illegible] which [illegible]eumo- To do away with the operat[illegible] interferes with the apparat[illegible] thorax is being induced, [illegible] we have so designed i[illegible] that a switch is the [illegible] part which needs [illegible] handled. The [illegible] explain the ope[illegible] is a front v[illegible] a two [illegible] instrument [illegible] other [illegible] a wooden [illegible] the height [illegible] aperture the quantity [illegible] manometed into the [illegible] for cavity. The [illegible] itself shows [illegible] of marking—e.g., "Start Operation," "Intrapleural Pressure," "Air Introduction." The water-valve E is to control the flow of the fluid into the bottle and is in the centre of the switch. The other is a diagrammatic sketch of the apparatus. There are two bottles—1 and 2 kept at a constant level. All india-rubber tubes pass through the switch-ways A, B, and C, while E represents the water-valve described above. To perform the operation it is first necessary to see that the level of fluid (e.g., 1 in 80 carbolic acid) in bottle 2 is at hanero. The water-valve is then turned until a slow althougm of fluid leaves bottle 1 and enters bottle 2. the Dangtch is then turned to "start operation" and powerful or of fluid is automatically stopped. The restriction, such to the tube is then inserted into the royal. The sale o[illegible] [illegible]avity and the switch turned to "intrapleural [illegible]ure." The manometer reading having been [illegible]aken, the switch is then turned to "air introduction." The fluid will now flow into bottle 2, and air into the pleural cavity. During the operation it will be found necessary to observe the true intrapleural pressure. This can be done simply by switching back to "intrapleural pressure." At the end of the operation the switch is turned back to "start operation," and the water-valve closed (screw action). All that is now necessary is to change round the bottles and bring the level of fluid to zero, and the apparatus is ready for the next patient. The whole instrument is contained in a leather case from which it can easily be slipped out. Messrs. A. F. Browne, of York-road, London, S.E., are the makers of the apparatus.

A. CLAUDE M. ELMAN, M.D., M.R.C.P. Lond.
H. CAMERON-WRIGHT, F.C.S.

DIAGRAM 1.

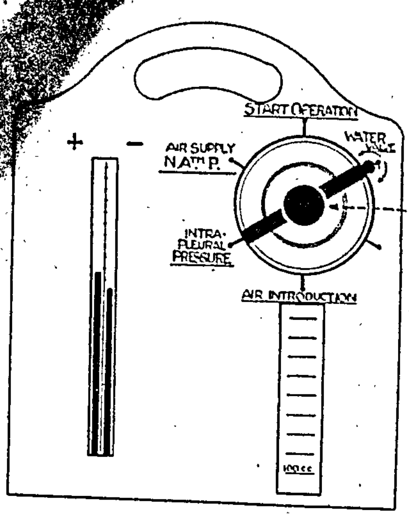
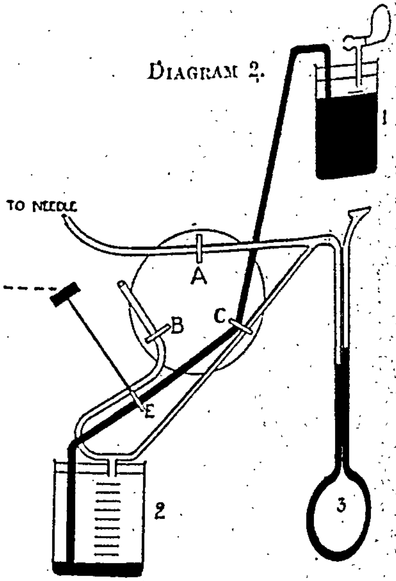


DIAGRAM 2.



REVIEWS AND NOTICES OF BOOKS

La collapsotherapie de la tuberculose pulmonaire.

By Michel Leon-Kindberg, Médecin des Hôpitaux de Paris. Paris: Masson et Cie. 1931. Pp. 181. Fr.22.

Étude sur le traitement de la tuberculose pulmonaire chronique basé sur de nouvelles recherches cliniques et expérimentales.

By Dr. C. M. Desvernine, des Facultés de New York, Paris et Madrid. Paris: Louis Arnette. Pp. 98.

Collapse therapy dominates the modern treatment of pulmonary tuberculosis. Sanatorium treatment is chiefly of value because a sanatorium provides the best possible conditions for carrying out collapse therapy, a staff trained in the special technique required for its successful employment, an X ray department operated by one who has made a special study of chest radiology, abundant fresh air—often lacking in a town hospital—and a duration of institutional treatment not possible in an ordinary hospital. But the sanatorium is not essential for the successful treatment of pulmonary tuberculosis whereas collapse therapy is essential in many cases. Dimly envisaged by Arnould in 1770, realised by the physiologist Carson in animal experiment in 1819, and first consistently practised by Forlanini (1888) the "patents of nobility" of artificial pneumothorax, to employ the expression of Rist, have a quite respectable antiquity.

It is only in recent years, however, and notably since the Great War, that collapse therapy has found universal acceptance and been successfully practised in the four continents. The principles upon which it depends, the methods employed in its use, the developments in chest surgery to which it has led, and the benefits to be expected from it should be realised by every medical practitioner. The seeker after knowledge in this department could not find a better guide than Dr. Leon-Kindberg, an enthusiast who never allows his enthusiasm to upset his judgment. And this admirable little book is evidence not only of his practical knowledge of his subject, but also of the breadth of the writer's mind. He is never afraid to explain "this is a little tip of my own, probably other workers get quite as good results without using it." After an introductory historical section the author devotes three chapters to artificial pneumothorax treatment. A chapter on oleothorax, concerning the future of which Dr. Leon-Kindberg does not seem to be very hopeful, precedes a short description of the surgical interventions which have been designed to supplement or replace pneumothorax treatment when the success of the induced pneumothorax has been in jeopardy through adhesions, or when an adherent pleura has prevented its employment. The practitioner who wishes to know what happens to his patient when he has been sent to a sanatorium or who wishes to be in a position to advise his tuberculous patient on the wisdom of accepting collapse therapy could not do better than read this book.

Dr. Desvernine's little book, which appears to be a continuation of a brochure published by the author under a similar heading in 1921, consists of two essays on the treatment of tuberculosis. The first deals with treatment by artificial pneumothorax and the second by specific immunity methods. In the first essay the writer suggests that the effect produced by collapse therapy is due to a variety of cellular and intercellular activities resulting in increased tolerance for tubercle antigen, and he sees in all this an interrelationship with the vegetative nervous system. The second essay consists in a short exposition of his own specific treatment by inoculation of infected guinea-pigs with autolysate of tuberculous sputum. The writer has made free and generous use of quotations from all and sundry, but the arrangement of his matter leaves something to be desired. There are several pages of bibliography.

Operative Obstetrics on the Manikin.

For Students and Practitioners. By Charles B. Reed, M.D., F.A.C.S., Associate Professor of Obstetrics, North-Western University Medical School, Chicago. Philadelphia: P. Blakiston's Son. With 254 illustrations. Pp. 134.

Since the more widespread adoption of antenatal supervision the practice of many teaching obstetric hospitals is becoming more and more restricted to normal cases and opportunities for the student to see the treatment of obstetric complications are consequently becoming fewer. Even when complications were more common the student rarely had a chance to treat them himself and we have always felt that such lack of opportunity might be made good to some extent by constant practice on the manikin. Such practice has many advantages. Procedures can be repeated as often as necessary to give the operator confidence and dexterity, and there is almost no limit to the operations that can be carried out and to the complications that can be invented. For this reason we welcome this work which the author claims to be the first on the subject in English.

The book is divided into two parts. Part I. is taken up with operations on the manikin. These are described in detail "commencing with the simplest and gradually advancing to the more difficult and dangerous." The various steps in each manœuvre are explained minutely in the text, and illustrated by numerous diagrams and pictures, so that the student with this book to guide him hardly requires supervision. Our first thought on receiving the book was one of surprise that no one had thought of producing such a work before. We feel that it should be in the hands of every teacher of obstetrics and available for every student. Its great merit is the precise and detailed directions for carrying out the various operations described so that at no point is the student left without guidance. Certain errors and omissions are noticeable. It is stated (p. 150) that for external cephalic version there is but one indication—viz., transverse presentation. "External version might be done to avoid a breech delivery but such a manouver is not called for." With this opinion we cannot agree, for in our view one of the most valuable procedures in midwifery is prophylactic external version in breech presentations. In the description of the delivery of the after-coming head in breech cases there is no mention of the value of the forceps on the head when moderate jaw and shoulder traction fail to deliver. Part II. (seven chapters) is not occupied with operations on the manikin but with other operations that could not be carried out on the manikin (such as Cæsarean section and the artificial interruption of pregnancy); and to accounts of such conditions as antepartum and postpartum hæmorrhage. Doubtless these are introduced in an attempt to make the book a complete text-book of operative midwifery, but this entire part would have been better omitted since the operations described do not properly come under the title of the book, and are more fully treated elsewhere.

We had hoped to find somewhere a description of the best kinds of manikin available and especially, seeing that the author rightly advises the use of the stillborn fœtus rather than the "puppet" as better and far more instructive, some directions might have been given on the best way of preserving the fœtuses. The "furfurol" method for this purpose is used in the Sloan Hospital, New York, and in University College Hospital, London; a fœtus treated by this method is preserved indefinitely and at the same time kept soft and flexible.

We can confidently recommend the work; the idea is original and the matter is sound.

Diseases of the Tongue.

By W. G. Spencer, M.S., F.R.C.S., Consulting Surgeon, Westminster Hospital; and S. Cade, F.R.C.S., Assistant Surgeon to the Hospital. London: H. K. Lewis and Co., Ltd. 1931. Pp. 561. 35*s*.

This book represents the third edition of Butlin's classical monograph on the tongue and its diseases, but it has been revised, altered, and rewritten to such an extent that it is actually a new work on the subject. Mr. Spencer and Mr. Cade give a good account of the many diverse affections of the tongue and mouth, but the real merit of the work lies in the attempt the authors have made to evaluate the modern methods of dealing with cancer of the tongue. This section, of course, deals largely with radium treatment, and we observe with some satisfaction that the authors have not used massed statistics, but base their opinion solely upon their personal experience. To the reader who desires information upon radium therapy from this point of view we commend this book. The authors are enthusiastic in their praise of radium, and in their belief in future improvements in its use, but are not blind to its limitations and the many failures they have experienced. The book does make the serious student feel that radium therapy is very far from being the solution of the cancer problem, though undoubtedly in certain circumstances it can accomplish more than any other means at our disposal. The book is profusely illustrated, pleasant to read, and has a good bibliography.

The Mongol in Our Midst.

Third edition. By F. G. Crookshank, M.D., F.R.C.P. London: Kegan Paul, Trench, Trübner and Co., Ltd. 1931. Pp. 539. 21*s*.

If Dr. Crookshank had belonged to another age he might have spent a happy life pricking o'er the plain in burnished armour seeking occasions for martial impact. When, after a hearty joust, he found that the lady to whose rescue he had galloped was without either personal charm or need of assistance, he would have bound his wounds cheerfully, remarking: "What matter? It is as if I had seen a damsel in distress, and anyway, it was a good fight." Such an attitude of mind is a joy to those who sympathise with it and a thorn in the flesh to those who cannot understand. In this new edition of "The Mongol in Our Midst" he reproduces the material which aroused so much controversy when it was first published in 1924, and adds to it a great deal of new matter and new photographs and a hearty reply to his many critics. His style is incisive and readable and the material of his thesis is undoubtedly stimulating. His book will be a delight to all those who like to wander in those realms of knowledge where the receptive mind can unfold to limitless possibilities while reason hesitates on the outskirts and orthodoxy turns shudderingly away. Dr. Crookshank marshals an array of facts which cannot be ignored; as he himself says, their explanation is yet to seek, but they command respect and sober reflection. No advance can be made in any direction by refusal to handle bricks which do not fit comfortably into the orthodox structure but which nevertheless remain lying about for the builder to stumble over. The bizarre and fascinating problem of the mongol is still far from solution, but nobody who is interested in it can afford to miss this book.

Die klinische und röntgenologische Untersuchung der Lungenkranken.

By Dr. Hans Philippi. Munich: J. F. Lehmann. Pp. 119. M.6.50.

This book is a short account of the usual clinical methods applied to the examination of the diseases of the thorax. Dr. Philippi describes briefly the symptomatology of respiratory disease, and then goes into a detailed description of inspection, palpation, percussion, and auscultation of the lung, covering fairly fully all the well-known ground. In the chapter on the radiology of the chest a rather large proportion of space is devoted to screen examination. Two pages are concerned with the examination of the upper respiratory tract, and a final chapter with temperature recording. The book would have been more helpful had it been possible to include more diagrams (there are only three) and a few radiograms of the normal thorax. Although various authorities are quoted in the text there is no bibliography and no subject index.

A Treatise on Light.

By R. A. Houston, M.A., Ph.D., D.Sc., Lecturer in Natural Philosophy in the University of Glasgow. London: Longmans, Green and Co., Ltd. 1930. Pp. 494. 12*s*. 6*d*.

The author does what he sets out to do, the subject matter is lucidly explained, and is illustrated by well-chosen line drawings and coloured plates. While essentially a book for the student of physics who can tackle the mathematics, it will be found useful to those who want a work of reference dealing with a very wide range of the subject of optics. The chapters on polarisation, spectroscopy, the infra-red and X rays, the eye and colour vision bear on medical science, the last-named chapter including some excellent illustrations of optical illusions. The final chapter is on the ether and relativity, and will be found to offer a very clear account of the initial need of physicists for a luminiferous ether and of their subsequent arguments that perhaps after all it is not necessary.

Altogether a book which can be thoroughly recommended.

THE LANCET.

LONDON: SATURDAY, JUNE 6, 1931.

PHYSICAL TREATMENT CLINICS.

THE big demand for treatment by physical remedies at the Clinic for Rheumatism set up by the British Red Cross Society in Peto-place proves—if proof be required—that work of this kind is badly needed. Six years ago[1] we announced the formation of a small committee on rheumatism, and we hope that the proposal of that committee, now partly realised by the Society, to establish a central demonstration clinic in London for research, treatment, and teaching is well on its way to fulfilment. To erect a medical centre with such a comprehensive programme is no slight undertaking, and cannot be immediately accomplished. Well may the directors of the Clinic confess that they have been confronted by many new problems, and that the experimental stage of the work is by no means at an end. On the treatment side it involves far closer study than has yet been given of the actions and reactions of a large number of physical procedures in the early stages of rheumatic disease. New lines of observation and research have to be mapped out. And, above all, the best available experience, from England and from other countries where rheumatic diseases prevail, has to be obtained. The medical use of baths is at present an unfamiliar field, although within the last few years diligently cultivated here and there. It would be wasteful if new groups failed to begin their work at the advanced point where these others had arrived. Moreover, in any national effort, such as that foreshadowed by the Society, the interwoven studies of treatment and ætiology must be combined with the theoretical and practical teaching which is immediately necessary for the right extension of such clinics throughout the country. Incidentally, we commend the suggestion recently thrown out that these clinics should be organised for different lines of investigation.

A year has elapsed since the opening of the Peto-place Clinic, and similar centres are being planned in other places. In these circumstances the original aims of the committee to which we have referred may well be recalled. Relying upon the experience of the Red Cross Clinic for the Physical Treatment of Disabled Officers, in 1916–1918, they suggested that the same combination of baths with other physical methods should be used, on a much larger scale, with special precautions against chill and fatigue, which nullify the effect of such treatment in rheumatic cases; also that in the proposed clinic the same close study and expert treatment should be given to rheumatic disability as was devoted at special clinics during the war to other forms of disability. Among the conditions of success laid down were careful selection of cases, close study of the reactions to heat and cold in rheumatic subjects, special investigation of selected cases, and the service of a specialist in physical methods, who should devote himself for some years to the study of rheumatic conditions. Subsequent experience has justified these proposals. The new studies of the circulation of the skin in rheumatic disease, of abnormalities of surface temperature, of defective reactions to heat and cold, of the effect of graded and local applications of heat, have gone far to explain the value of balneotherapy in these diseases. They may even be held to establish the claim that surface remedies, properly employed, are an essential part of the treatment of rheumatism. Unfortunately here, as elsewhere, the more powerful the remedy the more easily it is misapplied; the physical physician, not less than the surgeon, is in need of special training, experience, and technical dexterity.

In the development of this movement in the towns these conditions of success ought to be borne in mind. What is really new and unfamiliar in these clinics (outside the spas) is the precise use of baths, by which certain desired reactions are sought. Various forms of radiation, electricity, manipulation, are common property in the hospital and elsewhere. The essential feature in the clinic for rheumatism is the combination of balneotherapy with these other methods. The British Red Cross Society is probably right in thinking that this can be best effected sometimes in a large hospital, sometimes in an independent out-patient centre. We cannot doubt that the ruling principle will be accepted that in all departments or independent clinics where special treatment is given it must be directed by medical men highly experienced and skilful in such treatment. In a hydrological department, as the Society admits, difficulties were experienced because attendants qualified for hydrological work were not available. But if bath departments or clinics for rheumatism are to form part of the hospital and medical service, it will obviously be necessary to make arrangements for adequate training to cover the methods of treatment employed. In the case of radiology and electrology that has been already done, but at present there are no facilities in this country for post-graduate training in hydrology. We cannot allow that the solution set forth in the Society's pamphlet[2] is adequate—the stipulation that, for example, in the election of six physicians for a clinic to treat 500 persons daily "one or more of those elected should have a special knowledge of hydrology and electrology." At a bath clinic in which special treatment, investigation, and training are concurrently carried on, the most highly *specialised* medical direction is required.

We agree with the Society that a chain of well-organised clinics of this kind is greatly needed.

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[1] THE LANCET, 1925, ii., 100.

[2] See THE LANCET, April 4th, p. 767.

ANNOTATIONS

THE DANCE OF DEATH.

FOR 500 years the motif of the Dance of Death has fascinated artists, and most travellers will have seen one or other of the well-known series of pictures in situ, while quite a literature has grown up around them. But there was room for this book,[1] because the author has had an ingenious and original idea. He has written a series of interesting chapters round a collection of prints which he has made of the representations of death in art, and his learned text, which is profusely illustrated by reproductions from many of the well-known frescoes and woodcuts in which death forms a serial subject, has a special medical interest.

The figures in the Dance of Death, whether they dance or not, have certain things in common due probably to the origin of the theme as a survival of a church festival. Members of the various ranks of society, from Pope and Emperor, through the official and professional classes, down to the peasant, are depicted, each in company with a skeleton, which dances, drags, or clutches him to the grave; and the common message, whether the grim procession is painted on walls or printed in block books and incunabula, is that in the presence of death all are equal. The physician is nearly always represented in the series, and Prof. Warthin has examined the particular treatment of the doctor and manners of the accompanying skeleton in order to gauge the social position occupied by medicine in the different centuries. For this purpose he divides the pictorial displays into time periods. Of these the first two, covering the period preceding the great Holbein, witness the frescoes placed on the walls of churchyards, and the production of block books and the earliest printed books, such as illustrated prayer books. During the fourteenth, fifteenth, and sixteenth centuries it can be surmised that the physician was mounting more or less regularly in social scale as indicated by his place in the processions and the character of his clothes. But his rendering is not complimentary, for his sole professional accomplishment would appear from the pictures to be urine-gazing. Holbein mitigates the implied criticism. So many editions, copies, and facsimile reproductions of the Holbein Totentanz have been published that the beautiful drawing of the physician with his hour-glass and sleeping dog being visited by a venerable patient in company with death is familiar to everyone. Now here the physician is treated with dignity. Death holds the inevitable urine-glass, and appears to indicate the futility of any doctor interfering between him and the aged, but the doctor himself is drawn as a student and not as a quack and the detail of the open hand in expectation of a fee is omitted. Holbein had many imitators, and Dr. Warthin writes as an expert upon their work, which following the example of the master, became satirical and secular, all the religious spirit having now disappeared. The doctor, as the date changes, changes in clothes and manners, but there is not much indication that he has developed in scientific knowledge. Through the eighteenth and nineteenth centuries up till the present day artists have used the old motif as a text for new treatment. And as society became more complex the doctor was no longer given any prominent rôle in the dramatis personæ, which, to judge from Dr. Warthin's collection, is just as well for our repute, since with few exceptions, the doctor plays a sorry part in these series.

THE VIVIAN POORE MEMORIAL.

WORK is proceeding under the scheme for a memorial to the late Dr. George Vivian Poore, inaugurated by the National Homecroft Association, announced in our columns some months ago.[1] Ten rural workmen's dwellings, built on the homecroft plan near Cheltenham, are to be fitted, as nearly as possible, with exact models of the natural rural sanitation which Poore advocated; and later it is hoped to raise a small building to his memory. Prof. J. W. Scott, of University College, Cardiff, who is acting as secretary to the association and to the memorial committee, has good hope of seeing two of the models in operation this summer, probably more if funds permit. It is not without its interest that Poore's scientific results in preventive medicine should at this comparatively late date have reached a lay body such as this association, which is ready to try to raise funds to push them. Local authorities in rural areas are still doing the stupid things which Poore long ago exposed; but time has its revenges. All who are interested in Poore's work and memory are invited to the next meeting of the memorial committee, over which Dr. F. G. Crookshank will preside, to be held in Church House, Dean's Yard, Westminster, on Thursday, June 11th, at 2.30 P.M., when Dr. Scott will present a report.

THE COMMON COLD AND THE WEATHER.

IT is a matter of common observation and belief that colds in the head and other forms of upper respiratory disease are associated with wintry conditions, and it has lately been impressed upon the public that damp cold is much more likely to cause catarrh than dry cold. Dr. W. M. Gafafer[2] has made a study of the relation between upper respiratory illness and weather elements over a period of 82 weeks. The volunteers came from the Johns Hopkins University and consisted of medical students, students of the school of hygiene, and members of the common cold research staff. A second group consisted of about a hundred families living in Baltimore, selected for their intelligence, willingness to coöperate, and the presence of children. The 82 weeks were divided into two cold periods and a warm period. In the cold period there was a slight indication among the medical group of an increased tendency to colds when any one of the following weather elements fell below its ordinary level: minimum temperature, average temperature, dry bulb temperature, and vapour pressure. The maximum temperature, the temperature range, the humidity, the rainfall, the wind-velocity, the sunshine, and the atmospheric pressure seemed to have no effect on the incidence of respiratory illness. Among the family group, however, there seemed to be no correlation whatever between the upper respiratory attack-rate and the weather during the cold period. During the warm period the rise in attack-rate in the medical group seemed to be associated with a fall in minimum temperature, average temperature, temperature range, dry bulb temperature, vapour pressure, sunshine, and atmospheric pressure. In the family group the associated weather factors seemed to be minimum temperature, average temperature, dry bulb temperature, and sunshine. The conclusion of the two investigations is that changes in weather during a warm season are probably far more closely associated with colds in the head than similar changes during the cold season.

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[1] The Physician of the Dance of Death. By Aldred Scott Warthin. New York: Paul B. Hoeber. 1931. Pp. 142. $7.50.

[1] THE LANCET, 1930, ii., 1248.

[2] Amer. Jour. Hyg., May, 1931, p. 771.

PREOPERATIVE INVESTIGATIONS.

THERE was a time when the preoperative investigation of a patient consisted in the use of the stethoscope and no more, but now there seems no end to the tests regarded as desirable before a patient may safely be handed over to the surgeon. Mr. Lawrence Abel's interesting views on this subject, set out in our last issue (p. 1191), find a parallel in those of Prof. Marcel Labbé.[1] Dr. Labbé, like Mr. Abel, insists on an inquiry into the renal and cardiac functions, with examination of blood and urine, but he also lays stress on the hepatic functions. Besides the usual search in the urine for albumin, leucocytes, and casts, and an estimation of the blood-urea, he would use the phenol-sulpho-phthalein test. He also draws attention to the significance, from the renal point of view, of the blood pressure. He is less concerned than Mr. Abel with the investigation of the cardiac system and does not mention the cardiac index, although he would have an electrocardiogram in the presence of any disturbance of rhythm. His blood tests include an ordinary complete blood count with estimation of hæmoglobin and the coagulation time, and, like Mr. Abel, he would give a blood transfusion in a case with a low red cell count. The hepatic functions occupy the greater part of Labbé's paper, and he recommends chromoscopy—the study of the elimination of coloured substances from the blood by the bile. He regards the glycosuria produced by the ingestion of glucose as an unsatisfactory index of the glycogenic function and insists on a record of the hyperglycæmic curve. This test, however, is not enough in itself for a diagnosis of hepatic insufficiency, since pancreatic, nervous, and endocrine factors are also involved. The proteolytic function of the liver must be studied; the most precise results are furnished by Philibert's method of giving amino-acids and estimating the amino-aciduria, which should not be above 3 per cent. in the normal subject. The amount of ammonia excreted rises with an acidosis, but it may be present in the absence of acidosis in the course of certain grave hepatic lesions. Errors of nitrogen metabolism may be revealed by the relationship of the colloidal nitrogen to the total nitrogen excreted. Disturbance of the proteolytic function may be shown by Fosse's method of administering urea. The blood nitrogen is considerably reduced in hepatic insufficiency, cirrhosis, and simple catarrhal jaundice. The lipolytic function of the liver is difficult to estimate; often the estimation of urinary ketose—in the absence of diabetes—reveals grave disorder of the liver. Finally, the liver should be investigated by the study of the biliary function and of the blood coagulation. In diabetics Labbé thinks that the acidosis is more important than the glycosuria; the alkaline reserve should always be studied. In the presence of any endocrine disorder the estimation of the basal metabolism must not be omitted, and there must of course be the usual routine examination of the respiratory system. It may be presumed that many of these precautions are taken only when there is doubt of the candidate's fitness. But surgeons may well wonder how they managed to achieve such a high percentage of success before the physicians and pathologists came to their aid. Perhaps they made a habit of looking at the patient.

ANATOMY AT KING'S COLLEGE, LONDON.

WORK has now begun on the new anatomy department of King's College, London, which is being constructed in two additional storeys on the roof of the existing buildings at a cost of over £60,000. Greatly increased laboratory, research, and museum accommodation will be provided. The department in future will be in close topographical association with the other biological departments of the college, and for their general use a suite of rooms for animal experimental work is being included in the new building. These extensions represent the first step in execution of the building programme set out in the centenary appeal of the college. The next will be the conversion of the old anatomy department into an extension of the chemistry department. The extension and modernisation of the medical department of the college has been undertaken to meet the needs of the large and growing pre-clinical school, which is associated on the clinical side with four of the London teaching hospitals—King's College, Charing Cross, Westminster, and St. George's.

MEDICINE IN RUSSIA.

AUTHORITATIVE statements on conditions in the Soviet republics are few and far between, and it is almost impossible to gain an accurate idea of the state of medicine in a country so vast and so obsessed by political prejudice. Nevertheless, a recent article by Dr. H. Hamperl[1] gives the impression of impartiality and confirms information from other sources. Private practice, he says, became almost extinct under the first revolutionary government, but recovered a certain degree of freedom with the end of the civil war and the institution of the new economic policy. The government, however, pressed on it more and more hardly by the expansion of its public dispensaries, and the intensive campaign against the "capitalist elements" in 1929, hastened its downfall. The medical situation in Russia and the other Soviet countries is therefore dominated by the ambitious policy of a State medical service available to all citizens (needless to say, with preference in favour of workmen and peasants and their dependants) operating through hospitals, sanatoriums, and ambulant clinics, and the problem is the provision of sufficient doctors to staff the new establishments. The number of medical practitioners available is estimated to be 44,500 and the Five-Years' Plan includes the training of 37,500 more. The teaching facilities are naturally inadequate and it cannot be easy to find additional teachers to order. Moreover, Dr. Hamperl says, the students are selected exclusively from the working classes and are given only from one to three years' pre-medical instruction, so that by the time they approach their medical course they are not in a position to profit by the ordinary lecture system. The authorities have therefore been obliged to institute the "seminary" system of instruction in small groups, the members of which pass on the instruction to the remainder. The course of instruction has, follow up the babies who attend the welfare centre during the first year of their life.

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[1] Bull. et Mém. Soc. de Méd. de Paris, May 8th, p. 316.

[1] Wien. klin. Woch., April 10th, p. 483.

The speech clinic has now been working for 18 years, and the number of admissions is increasing. The fathers' and mothers' centre has moved into an enlarged building where there is scope for new ventures, bigger nurseries, and an open-air roof garden, while the old informal atmosphere is maintained.

TO BOOK LOVERS.

Messrs. Sotheby are announced to sell shortly, in the New Bond-street auction rooms, London, two rare books which have direct interest for the medical profession as well as the bibliophile. The first is a translation of Ulric von Hutten's "De Morbi Gallici Quæstione, &c.," published in 1539, the translation being entitled "Of the Wood called Guaiacum that Healeth the French Pockes." Guaiacum had been introduced into Europe by the Spaniards some 20 years before, although the action of the resin was not known till later. Von Hutten's treatise was written shortly after his famous epistolary satires on theologians and was translated by Thomas Paynel and published in London by one, Thomas Berthelot. The disease referred to is, of course, syphilis, which we called after the people from whom it was introduced into Britain, just as they named it after the Italians who, in turn, blamed it on to the Spaniards. The other book is rarer, probably, for it is thought that but two other copies exist, one in England and one in America. It is a small paged octavo volume by Dr. John Caius, and was published in 1552 in London by R. Grafton. The name of it is "A Boke, or Counsell against the Disease commonly called the Sweate, or Sweatying Sicknesse." This is Caius's famous treatise on a remarkable epidemic, which exists in the form of an English translation only, save for these rare examples. It may be added that the lot preceding Dr. Caius's book is a copy of the first edition of Sir Thomas Browne's Pseudoxia Epidemica, 1646, which is much less rare than the other two books, though fully as interesting from the medical aspect.

A TREATMENT FOR CARBUNCLE.

THE carbuncle is the prototype of indolently progressive inflammation, and is seldom seen at its worst in young persons, since their defensive mechanisms are active enough to lead to early and brisk suppuration. Treatment may reasonably aim, therefore, at increasing general and local resistance, and for the past four years a method has been tried in Prof. Bier's clinic in Berlin which is intended simply to amplify the local reaction to infection, which is assumed to be deficient in such cases. The immediate object is to produce an active capillary hyperæmia, and for this purpose a pure solution of arnica is used, prepared in ampoules and sold under the name Arnusit. W. Gerlach,[1] who reports on the results, points out that the injections must be made into healthy tissue in the vicinity of the infected area, and not into the carbuncle itself, which is already so poisoned that it cannot respond normally. For the same reason it is unnecessary to surround the lesion with a ring of injections, and this moreover would employ too large a bulk of a drug poison. Very minute doses prove sufficient, and they are given subcutaneously at least a hands-breadth away from the zone of inflammation. A burning pain follows but can be controlled to some extent by pressure with the finger. No further injection is given for 24 hours, by which time, as a rule, the artificial hyperæmia has disappeared. The treatment is then repeated as often as may be necessary. The number of injections required depends on the stage at which they are begun, and it occasionally happens that six or eight are needed before suppuration occurs. Meanwhile, it is said, the symptoms are obviously controlled. Pain and fixation disappear almost at once, and the patient feels better. The symptoms soon return however; the temperature rises, and in 24 hours the bluish periphery of the carbuncle assumes a ruddier tint, which is regarded as evidence of acceleration of the more acute stage. The same phenomena are provoked by the second and third injections, if required, but no case appears to have needed more than eight injections in all. An increased tendency to small local hæmorrhages at each change of dressing will usually be noted and need not be feared; it springs from an activated blood-supply and is easily controlled by pressure. A further local manifestation of the protective response is the development of superficial pustules near the carbuncle, while marked general sweating is a common sign of recovery. Healing of the lesion is sometimes associated with a local itching which is in striking contrast with the pain caused by the slightest pressure on an untreated carbuncle. Gerlach claims that if the case is treated in its early stages, before necrosis has begun, the whole process remains localised and subcutaneous, and the pus is evacuated through a pea-sized opening, so that the scar is subsequently invisible. The best local dressing is a moist compress of diluted arnica in normal saline. Furthermore he says that large boils mostly involute after one or two injections, and cases of lymphadenitis, bursitis, and superficial cellulitis can be similarly aborted.

It will be noted that the treatment here described bears a resemblance to the use of setons, formerly much in favour.

Mr. D. P. D. Wilkie, professor of surgery in the University of Edinburgh, is acting as director of the surgical professorial unit at St. Bartholomew's Hospital during the first fortnight in June. He takes over the duties of Prof. Gask and also lectures to the students. Each year an exchange of this kind is made, and the experiment has been notably successful.

To celebrate the centenary of the Harveian Society of London a meeting will be held at St. Bartholomew's Hospital at 3 P.M. next Thursday. At 3.15 P.M. Dr. Raymond Crawfurd will deliver an oration on the Place of Medical Societies in the Progress of Medicine. Exhibits of interest in connexion with Harvey will be on view in the library from 4.30 P.M.

AT the annual general meeting of the Research Defence Society, to be held at 11, Chandos-street, W., at 3.30 P.M., on Wednesday next, Dr. H. H. Dale, F.R.S., will deliver the fifth Stephen Paget memorial lecture. His subject will be the Effect of Research on Curative Medicine.

EAST END MATERNITY HOSPITAL.—Dr. W. H. Oxley, hon. medical officer, reports that "booked cases" have numbered 10,366 during the last five years. Of these only one healthy mother died as the result of childbirth. Six others who died "were seriously ill before labour commenced with some disease quite apart from pregnancy, which either entirely caused or contributed to the fatal result."

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[1] Münch. med. Woch., May 8th, p. 783.

SPECIAL ARTICLES

PATIENTS' WAKING HOURS IN LONDON VOLUNTARY HOSPITALS.

REPORT BY A SUBCOMMITTEE OF KING EDWARD'S HOSPITAL *FUND FOR LONDON*.[1]

THE management committee of King Edward's Hospital Fund for London, having received from the distribution committee the report of a subcommittee on the subject of patients' waking hours, resolved that the report be circulated for the consideration of the hospitals concerned, in the hope that it may assist the hospitals, so far as their different circumstances may permit, to fix an hour not earlier than the time suggested in the report.

The attention of the Fund's visitors was explicitly directed last year to a series of questions grouped under the general heading "Comfort of Patients." One of these questions dealt with the hour at which patients are awakened in the morning, and the distribution committee asked for a special report on it.

The replies of the visitors were accordingly referred by the distribution committee early in 1931 to a subcommittee consisting of Mr. Walter Spencer (chairman), Dr. Morley Fletcher, Mr. Eardley Holland, and Sir Harold Wernher, and their reports are summarised below:

The hours of waking are summarised, for the different groups of hospitals, in the table in an appendix. This table gives the following results, classified under the earliest hour mentioned by the *visitors*:—

(*a*) 4, 4.30 or 4.45 A.M.	4 hospitals.
(*b*) 5 or 5.15 A.M.	40 „
(*c*) 5.30 or 5.45 A.M.	22 „
(*d*) 6 A.M.	44 „
(*e*) 6.30, 6.40 or 6.45 A.M.	8 „
(*f*) 7 A.M.	6 „
(*g*) Average of teaching hospital group	5.55 A.M.
(*h*) Averages of other general hospital groups	5.10 to 5.35 A.M.
(*k*) Averages of special hospital groups	5.30 to 5.55 A.M.

Amongst the hospitals where the hour is after 6 may be specially mentioned the Middlesex, where the recent change of hours has drawn a good deal of attention to the general question. The male patients are awakened at 6.30 and the female at 6.45.

Extra-Metropolitan Hospitals.

The general conclusions drawn from replies from 63 large general extra-metropolitan voluntary hospitals are as follows:—

1. That the day nurses in the majority of cases come on duty at 7 A.M.

2. That the night nurses in the majority of cases go off duty from 8 to 8.30 A.M.

3. That the time on duty of the night staff overlaps the time on duty of the day staff in the majority of cases from one hour to an hour and a half.

4. Work begins in the wards in 45 instances before 6 o'clock and in 18 instances at 6 o'clock or later.

5. The interval between the beginning of work and breakfast varies from 0 to 2¼ hours. The great majority of hospitals allow from 30 to 60 minutes.

6. The interval between the beginning of work in a ward and the visits of the honorary medical staff varies in those hospitals in which the honorary staff visit in the morning from 3 to 6½ hours. The majority allow 4 to 5 hours.

7. With regard to the extra staff required (i.e., for waking at 7 A.M.), the various opinions expressed reflect the difficulty involved in estimating the effect on staff whenever a load factor is increased sharply and for a limited period.

L.C.C. Hospitals.

The subcommittee also had before them a published report, dated November, 1930, by the Central Public Health Committee of the London County Council on the question "whether any, and if so what, medical or other advantages accrued to the patients of the Council's hospitals from being awakened before 6 A.M." The report states that in 10 of the 28 hospitals previously under the guardians, waking was at or before 5; that in 9 it was at 5 or later; and that in 9 it did not begin till 6. The Central Public Health Committee now propose that, so far as practicable, no patient should be awakened, except in special circumstances, before 6 A.M.; that the hospitals below that standard should be raised up to that standard as and when staff should be available; that the change should be gradual; and that the matter should be further considered in a year's time.

Items of Early Morning Work.

In considering the necessities of hospital work and the welfare and comfort of the patients there are other matters to be taken into account besides the actual hour of waking; and in these, also, there are differences in the procedure at different hospitals.

The various processes that have to be carried on throughout each ward include, for instance, the use of urinals and bed-pans, the washing of the patients and the making of the beds. The time-table has also to provide for the serving of food, which may consist of breakfast only, or of early tea first and breakfast later.

As this procedure has to be gone through with every patient in turn, much time is taken up. In arranging the hour when these processes must be finished, a sufficient interval must be left between breakfast and the light mid-morning lunch. Moreover, the washing, &c., for the patients who are dealt with last must be completed in time for the first visits of the medical officers. This, in the experience of the subcommittee, usually means by about 10 o'clock, though a good many of the returns from the extra-metropolitan hospitals mention an hour as early as 9. In calculating from this the time when work must be begun for the patients who are dealt with first, it is often the practice to decide on an official hour, but to arrange for work to be begun before that hour with such of the patients as happen to be awake.

Within the limits thus determined, the order of the different processes may vary. At some hospitals the patients are washed before breakfast, at others breakfast comes first. Sometimes as many as possible of the patients are washed before breakfast, and the rest afterwards. Sometimes early morning tea is served immediately on waking, and breakfast an hour or so later, after all the washing is done.

Another factor in the time-table is the division of the work between the night and day nursing staffs, and the hours when the night nurses go off duty and the day nurses come on. There is an overlap usually of from one hour to an hour and a half.

Suggestions.

The question is much more complicated than it might seem at first sight to those who think only of the actual hour of waking.

It is certainly a question on which the King's Fund, if it takes action at all, would only do so after consultation with the hospitals concerned. Nevertheless, the subcommittee have formed definite opinions on some points and consider that these may well be made the subject of consultation.

It has been shown that, in the London Voluntary Hospitals, 6 o'clock is at present the official hour of waking more often than any other hour.

There is also a good deal of evidence that hospitals which have already made a change to 6 o'clock from some earlier hour, or which would be prepared to consider the possibility of such a change as a practical question, would nevertheless regard the difficulties in the way of the adoption of so late an hour as 6.45 or 7 as insuperable.

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[1] London: Geo. Barber and Son., Ltd. May, 1931. 6*d*.

After taking these facts into account, and after having also considered the varieties of practice in the other matters mentioned in this report, the subcommittee are of opinion :—

(1) That, unless there is some exceptional and adequate reason to the contrary, the most suitable hour for the waking of patients is 6 o'clock ; bearing in mind the fact that, in a hospital, work closes down for the night long before the hour at which the patients are accustomed to go to bed when at home.

(2) That, while the adoption of any later hour would probably require an addition to the nursing staff, a change to 6 o'clock on the part of most of the hospitals which now have an earlier hour could probably be effected without any material increase of staff or expenditure.

(3) That, at some of the hospitals where the present hour is exceptionally early, it may well be impossible to change to 6 o'clock without increase of staff, but that nevertheless in those hospitals a change is so desirable that the question should be considered.

(4) That breakfast should be served as soon as possible after the hour of waking ; and that work involving the disturbance of the patients before breakfast should be limited as far as possible to what is necessary for their comfort.

(5) That, whatever the official hours may be, no patient should be washed before having either breakfast or early morning tea.

(6) That the rules and the practice should be such as to avoid as far as possible any noise in the wards before 6 o'clock.

AUSTRALIA.

(FROM OUR OWN CORRESPONDENT.)

ROYAL AUSTRALASIAN COLLEGE OF SURGEONS.

THE King has approved of the prefix "Royal" for the Australasian College of Surgeons. The college is an Australian and New Zealand organisation, and its chief objects are to improve the standards of surgery and of surgical training and research. To further these objects and to assist Australasian graduates who cannot afford the time and expense involved in a visit to England for the purpose, the Royal Australasian College of Surgeons has arranged with the Royal College of Surgeons of England that the primary Fellowship examination of the latter shall be held in Australia. The first examination will begin in Melbourne on August 11th.

The aims and functions of the Australasian college are similar to those of the English college, and a close association has arisen between the two. A gratifying expression of this is the fact that the council of the Royal College of Surgeons of England is presenting a mace to the Australasian college. The president of the Royal College of Surgeons, Lord Moynihan, will visit Australia early in 1932 to present the mace. That Lord Moynihan will personally present the mace is naturally regarded as a special honour for the Royal Australasian College of Surgeons. The mace, which is an exact replica of one given as a mark of royal authority to the English college is being designed and executed by Omar Ramsden, of London. It will bear the arms of the English college, the arms of the Australasian college, which have recently been granted by the College of Heralds, the arms of Australia, and the arms of New Zealand. Special permission has been granted by His Majesty for the use of the orb and cross in the design of the mace.

Lady Syme and her children have given the Royal Australasian College of Surgeons £2500 to form a research endowment fund in memory of the late Sir George Syme, the first president. The interest derived from this amount will be applied to foster surgical research, particularly in diseases common in Australia. The results of the research work will be presented in an annual memorial oration, called the Syme oration, which will be delivered at the general meetings of the college. Lord Moynihan has consented to give the first Syme oration at the time of the presentation of the mace to the college.

THE MATERNITY ALLOWANCE.

A sum of £5 is payable to every mother in Australia in respect of each parturition resulting in the birth of a viable child whether such a child be born alive or dead. The legislation to effect this payment was enacted by the parliament of the Commonwealth of Australia in October, 1912. The mother must be a native of the Commonwealth or intend to settle permanently therein. No payment is made in the case of an aboriginal or an Asiatic. Some idea of the financial responsibility of this legislation may be gauged from the fact that for the year ending June 30th, 1929, the total expenditure including administration was £661,520, of which the cost of administration absorbed £16,627. Analysis of these claims showed that 87 per cent. of the cases were attended by medical practitioners. The bonus is claimed by almost every mother in Australia irrespective of her social or financial position. The originators of this scheme hoped that it would increase the birth-rate or at least arrest the decline ; that it would diminish the maternal and infantile mortality, and render a difficult and dangerous period in women's life safer, and thus conduce to the national welfare. A review of the results from 18 years' experience of this legislation shows that the Australian birth-rate is steadily declining. No marked alteration has been effected in the puerperal death-rate. The lowest that has been attained was for 1915 with a rate of 4·27 per 1000 births. The figure for 1929 was 5·1. There has been a slight reduction in the infant mortality-rate which for 1929 was 51 per 1000 children born. It is considered, however, that a more important factor has been the establishment of baby health centres and the more widespread application of modern methods of infant management. An interesting and not unexpected result is that the proportion of maternity cases that have been attended by a doctor has considerably increased. At the inception of the scheme 65 per cent. of mothers were so attended, but in 1929 this figure had increased to 87 per cent. It is a discomforting fact that the maternal mortality-rate has not been thereby reduced.

Endeavours have been made by the federal committee of the British Medical Association in Australia to have the maternity bonus revised, and for the money thus set aside to be utilised for the establishment of more maternity hospitals, antenatal clinics, and infant welfare centres ; and for the provision of help for mothers and expectant mothers in necessitous circumstances. Another suggestion that has been made is that the payment of the bonus should be conditional on the attendance of the mother for antenatal examination at monthly intervals, either by her own practitioner or at clinics established for the purpose. These suggestions, however, have not received parliamentary approval, and the only inscription on the Statute Book was in 1926 when the word "Asiatic" was omitted from the list of those to whom no payment is to be made and the word "Alien" substituted. It would seem that the bonus, as a public health measure, is not giving value for the financial burden incurred. The original idea was not conceived by an obstetric mind. It seems that it was primarily a vote-catching device, and now the measure is so popular with the people that no government is sufficiently strong-minded to interfere with it. No qualification is placed upon how the payment is to be expended and instances are not wanting of its being utilised in keeping up the payments on the pianola while skilled nursing and medical services are neglected. The bonus has been termed "the recognition of motherhood" and it is looked upon in general as a rebate on taxation paid at a time when the arrival of the stork with his long bill has caused a temporary difficulty in the family budget.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

THE GERMAN SURGICAL CONGRESS.

AT the annual congress of the German Surgical Association, Prof. Victor Schmieden (Frankfort) presided, and in his inaugural address spoke against increasing specialisation in surgery. He announced that the discord existing since the war between the German Surgical Association and the International Surgical Association has now been resolved, so that German surgeons will be in a position to take part in the proceedings of the international organisation. He thanked Prof. Erwin Payr (Leipzig) and Prof. F. de Quervain (Basle) for their services in this connexion.

The first official subject of discussion, operation on peripheral nerves, was introduced by Prof. Hermann Küttner (Breslau). He said that in nerve injuries a certain reserve is advisable, for complete function may be restored after five to six months, even if the electrical reaction of degeneration has already appeared. Following suture of nerves function often returns after several weeks, and sometimes even after a year or 18 months. Neurolysis should be performed only in late cases. In paralysis of the facial nerve anastomosis of the facial with the hypoglossal nerve is recommended, but late suture of the injured facial nerve gives good results too. Severe pain may be produced by neuroses, callus, cicatrices, and foreign bodies. Injection of a 70 to 80 per cent. solution of alcohol is often ineffective against such pain, whilst higher percentages may injure the motor paths. Injections of formalin are preferable. In discussing more radical methods he described section of the posterior roots as being uncertain, and advocated section of the anterolateral columns.

The second official theme was operation for Graves's disease, introduced by Prof. Ferdinand Sauerbruch (Berlin). He spoke of the nervous causes of the disease as a sequel of strong psychic trauma. The result of operation depends on the pre-operative preparation of the patient. He recommended administration of iodine, after Plummer's method, for eight to ten days, and said that this has much contributed to the decrease of post-operative mortality. Prof. Paul Morawitz (Leipzig), speaking from the point of view of the physician, pointed out that vasomotor neuroses, Graves's disease, and thyrotoxicoses cannot always be distinguished. The treatment has become more and more a surgical one. Iodine therapy without subsequent operation is of doubtful value. Of a series of patients treated by radiotherapy 50 per cent. improved, 25 per cent. failed completely, and in no case was complete cure observed. Severe cases with exophthalmos do not become quite healthy even after operation, though able to work again. Prof. Paul Sudeck (Hamburg) recommended total removal of the thyroid gland in malignant goitre, its function being replaced afterwards by a continuous administration of thyro-iodine tablets.

Dr. Barthels (Leipzig) stated that stricture of the rectum is often caused by lymphogranulomatosis inguinalis, a venereal disease common especially in the tropics. Rectal diathermy is better than the formation of an artificial anus or irrigation of the rectum. In severe cases high resection must be performed. Dr. Bircher (Aarau) reported on his results of resection of the left vagus nerve in cases where the existence of gastric ulcer is presumed. Acidity was reduced to a quarter by the operation. In gastric ptosis resection of the sympathetic nerves to the pylorus and duodenum was recommended.

PROSECUTION FOR ARTIFICIAL ABORTION.

Discussion on the legality of artificial abortion has begun afresh because of the arrest, at Stuttgart, Wurtemberg, of a medical man and a medical woman on a charge of performing this operation in some hundreds of cases without sufficient medical indication. The police seized the books of the accused so that the names of the patients became known, and they were compelled to give evidence before the police judge. The accused did not deny the facts, but stated that they had performed abortion not to get money, as was alleged by the prosecution, the fees having been extremely low, but for social reasons. The patients were held to be unable to bring up healthy children in a proper way. The medical man had given the certificates, while the medical woman had performed the operation, which in no instance had done any harm. The man was after some time released on bail, but the woman was held in custody until she began a hunger strike, when she also was released. The prosecution of both practitioners has stirred up public opinion, the more so because they are members of the communist party, and the question has rapidly become political. Meetings have been held to protest against the prosecution, and at these the accused have explained their views. In articles in the general and the medical press the question is being discussed from every point of view. The public trial, which will be held in Stuttgart, is likely to be sensational.

DEAFNESS AFTER TRICHINOSIS.

In Stuttgart a year ago cases of trichinosis resulted from the consumption of bear's ham in a restaurant.[1] In one of the patients, who was conveyed three weeks later to the hospital in a somnolent state with sharp muscular pains, total deafness developed, without giddiness and without nystagmus. Otological examination showed that a toxic neuritis of the acoustic nerve was present. The patient was discharged two months after the poisoning, but did not recover her hearing.

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[1] THE LANCET, 1930, i., 937.

UNIVERSITY OF SHEFFIELD.—The chair of medicine at Edinburgh University has been offered to Dr. Albert Ernest Naish, F.R.C.P., who is at present lecturer on medicine at Sheffield. Dr. Naish has accepted the offer.

PUBLIC HEALTH SERVICES

A YEAR OF HEALTH IN SCOTLAND.

THE year 1930 was a peculiarly difficult one for the Scottish Health Department on account of widespread unemployment and the recent changes in local government. The approved societies have had to face a loss of income from their present members and the loss of the normal inflow of new young members, as well as increased outgoing for health insurance. The continuance of unemployment much longer on the present scale would create an anxious situation. The only good result of the unemployment that can be set against the suffering it has caused is the improvement and extension of public works that many local authorities have been persuaded to undertake to relieve the distress. The second annual report of the Department of Health[1] regrets that there has not been similar progress in town and regional planning. Only 11,056 houses were built during the year, which means that the output of new houses for the working classes has done little more than keep pace with the year's depreciation of old buildings, and there is still a shortage of 100,000 houses. The Housing (Scotland) Act, 1930, is, however, being well received by the local authorities, and there is evidence of a comprehensive and vigorous housing programme for the next three years. Reference is again made to the Edinburgh Town Planning Scheme, which differs from the ordinary scheme in that its object is to preserve and protect the features of an area already built up. Seven town councils passed resolutions during the year to prepare schemes for the unbuilt parts of their areas.

Local authorities have been active on water-supply and drainage schemes during the year. In July and August the Health Department issued inquiries as to the state of the water-supply in various districts, and a scrutiny of the replies showed that in many areas there was no margin for future extension and that in some the supply was not above suspicion; there has been considerable improvement. Energetic measures have been taken to prevent the pollution of rivers, and to improve the methods of refuse-collection and disposal. The Education (Scotland) Act, 1930, conferred power on local authorities to supply certified milk to school-children out of the education funds. An investigation into the effect of a daily ration of milk on 10,000 children in 67 Lanarkshire schools showed a definite increase in both height and weight over the controls. These two events gave the tubercle-free milk industry a valuable advertisement. The annual reports of veterinary inspectors under the Milk and Dairies Act provided an opportunity for ascertaining the number of tuberculous cattle in the country; the figures showed that 0·35 per cent. of cattle examined during 1929 were tuberculous. This, of course, is not the whole picture but, even after making allowance for additional factors, the figures are reassuring. An increased demand for tubercle-free milk would help towards the eradication of tuberculosis by the producers themselves.

Maternity and Child Welfare.

The past year has been one of consolidation and reorganisation rather than of extension. It is hoped that the correlation of the services for the pre-school child with the services provided by the educational authority will ensure a continuous care of the child from infancy to adolescence. The schemes for maternity and child welfare are based on home visitation, and at the end of 1930 there were 122 whole-time and 478 part-time health visitors in this service. There are two training institutions for these women in Scotland, and 45 new nurses were trained during the year. At the end of 1930 there were 202 centres for the medical examination of mothers and children, for instruction in the general hygiene of maternity and childhood, and for cookery and sewing demonstrations. The maternal mortality-rate for the five years ending 1929 was 6·6 per 1000 but, owing to different methods of classification, the statistics for Scotland are not strictly comparable with those for other countries. Of the total births during the year 1929 about one-half were attended by doctors and one-third by midwives, while one-sixth occurred in maternity institutions. A few local authorities provide home helps, and their service is much appreciated. The Central Midwives Board for Scotland have had under consideration a proposed addition to their rules, requiring the midwife to notify the local authority when a patient has not accepted her advice to consult a medical practitioner or attend a clinic during pregnancy. This arrangement has worked very well in Dundee for some time. The infant mortality-rate was 83 per 1000 births; there was a big increase in infant deaths at the end of the year, mainly due to respiratory trouble during foggy weather. Up to that time the conditions in the country had been favourable to a low mortality-rate. The spring epidemics of measles and whooping-cough were mild.

The pre-school death-rate (between the ages of 1 and 5) was 10 per 1000, the commonest causes of death being pneumonia, measles, and whooping-cough. Although there has been an improvement in recent years, children entering school are still found to have defects which might have been avoided or ameliorated by adequate supervision in the pre-school period. Mothers have learnt the importance of regular care for the infant, but have not yet realised that it is just as important for the toddler. Scotland hopes to solve the problem of her pre-school child by the education of parents; by the development of existing services of home visitation, centres, nursery schools, and day nurseries; and by the extension of the school medical service to provide for medical inspection of pre-school children at the time when the older members of the family are inspected.

A review of the medical inspections of school-children shows that on the whole children are better clothed and cleaner and suffer less from malnutrition, rickets, and defective teeth than they used to. The improvement is more pronounced in leavers than in entrants. One of the most striking testimonies of progress comes from Ayrshire, where the percentage of children with sound teeth has risen from 31·5, in 1925–26, to 56·5.

Hospital Services and Notifiable Diseases.

An outstanding problem before the new authorities is the improvement of the poor-law hospitals, which, with a few exceptions, are definitely below modern standards in construction, equipment, and staffing arrangements. A general movement towards raising the standards of medical treatment of the sick poor is anticipated, and the department hopes that the improvements will be carried through in coöperation with voluntary hospitals, universities, and other interests.

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[1] H.M. Stationery Office. 1931. Pp. 214. 3s. 6d.

The tuberculosis death-rate continues to fall: the figure for 1930 was again a record—88 per 100,000. The greatest relative improvement in both pulmonary and non-pulmonary forms has taken place in both sexes at ages under 15. The accommodation in approved institutions is now about 5000 beds, and there was no increase in this number during the year.

There was a severe outbreak of small-pox in Aberdeen during the summer, but apart from this there was no small-pox—even of the mild type—in the country. There was considerably more enteric fever than usual, and in some cases the source of the outbreak could not be traced. The Dumfriesshire outbreak, affecting 61 persons, was eventually attributed to a careless farm servant, whose fæces were infected with the bacillus, and a faulty field-drain from the farm lands in close proximity to faulty joints in the pipes leading from the springs to the reservoir tanks.

In 1926 60 beds at the Stobhill Hospital, Glasgow, were set apart for cases of encephalitis lethargica recommended by the Department. This accommodation has always been full and the waiting list long. Last year, therefore, the arrangement was terminated and the local authorities were invited to provide beds for their own cases. The Department expects that this will result in a considerable increase in the number of beds available.

Scientific Work.

During the year a Scientific Advisory Committee was appointed to assist the Department in applying the results of scientific research to the details of public health administration and in promoting such medical investigations as come within the sphere of the Department and of the local authorities. It is hoped that this committee will bring before the Department and the local authorities such discoveries as are of immediate application and the directions in which new knowledge should be sought.

Important developments have taken place in the arrangements for certification of the blind. In 1929 the Glasgow joint committee established a central clinic where persons claiming to be blind were examined by two ophthalmic surgeons. To regularise the position throughout the country the Department have recommended the establishment of similar clinics in other centres, and proposes to convene a conference of ophthalmic specialists to consider a standard form of medical certification.

ACCOMMODATION IN PUBLIC MENTAL HOSPITALS.

WARNING BY THE BOARD OF CONTROL.

THE Board of Control has sent a memorandum to local authorities pointing out that the demand for treatment without certification is likely to increase as the facilities of the Mental Treatment Act become more widely known. At the same time the shortage of mental hospital accommodation generally has become acute, and will oblige many authorities to consider what steps should be taken if they are to maintain a reasonable standard of efficiency and progress. Though there may be no increase in the incidence of mental disorders, the number of persons under care continues to rise because the total population and the average age of the population are both increasing.

There is now hardly any margin of accommodation in the public mental hospitals. On Jan. 1st of this year there were only 27 hospitals with ten or more vacant beds on the male side, and 19 with ten or more vacant beds on the female side. Thus, there are almost no unoccupied beds the use of which authorities can obtain by contract with other authorities; moreover, the practice of taking beds on contract, though useful in special circumstances, is strongly to be deprecated if it involves sending patients so far from their homes as to make visiting by their relatives prohibitive by the expense.

The standard of accommodation laid down by the Board is regarded as a minimum standard based on long experience, and a departure from it would be injurious. Overcrowding is not only bad for the patients' mental and physical condition, but imposes unnecessary strain and may involve danger for the nursing staff. Local authorities will, therefore, have to consider increasing the accommodation for mental patients, and there are two main ways in which this can be done—viz., either by redistribution of patients among the various types of institutions now under the control of the authority, or by the provision of new mental hospitals.

As regards redistribution there are four possible alternatives:—

(1) The utilisation of beds in public assistance institutions for the quiet chronic cases or senile cases, whose condition does not necessitate treatment of the kind that can only be given in the relatively more expensive beds of a mental hospital;

(2) The removal from mental hospitals of mental defectives who can be far more economically provided for in poor-law premises or in mental deficiency colonies;

(3) The granting of leave of absence on trial and boarding out, or discharging suitable patients to the care of relatives or friends;

(4) The provision in connexion with an existing mental hospital of an admission unit and convalescent villas where these do not already exist. In this connexion it is pointed out that every mental hospital, whether full or not, should have this accommodation, which has become imperatively necessary in view of the provisions made for the treatment of voluntary and temporary patients under the Mental Treatment Act.

The second main alternative is the construction of new mental hospitals, and the Board point out that there will be some authorities who will find themselves compelled before long to build such institutions. Local authorities which have no right of ownership in any mental hospital and which, therefore, have to secure by contract beds for patients for whom they are required to provide accommodation, are particularly concerned with this aspect of the question. As the shortage of accommodation generally becomes more acute, notices terminating existing contracts are being given, and some authorities will have no alternative but to make provision themselves.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED MAY 23RD, 1931.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 111; scarlet fever, 1381; diphtheria, 824; enteric fever, 37; pneumonia, 910; puerperal fever, 47; puerperal pyrexia, 103; cerebro-spinal fever, 56; acute poliomyelitis, 7; encephalitis lethargica, 10; dysentery, 10; ophthalmia neonatorum, 88. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on May 26th-27th was as follows:—Small-pox, 160 under treatment, 8 under observation (last week 200 and 8 respectively); scarlet fever, 1223; diphtheria, 1420; enteric fever, 13; measles, 181; whooping-cough, 417; puerperal fever, 32 (plus 11 babies); encephalitis lethargica, 180; "other diseases," 152. At

St. Margaret's Hospital there were 15 babies (plus 3 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 28 (4) from measles, 4 (1) from scarlet fever, 22 (8) from whooping-cough, 21 (1) from diphtheria, 47 (8) from diarrhœa and enteritis under two years, and 54 (6) from influenza. The figures in parentheses are those for London itself.

One death from small-pox reported for the month of April was provisionally assigned to Market Bosworth R.D., Leicestershire. West Hartlepool reported the only death from enteric fever. Only 3 deaths from meningococcal meningitis occurred in London. Six deaths from measles were reported from Leeds, 3 each from Liverpool and South Shields. Liverpool reported 3 deaths from whooping-cough. Diphtheria claimed 6 victims at Liverpool, 2 at Bootle. Diarrhœa was credited with 7 deaths at Manchester, 4 at Liverpool, and 3 each at Wolverhampton and Birmingham. Birmingham reported 7 deaths from influenza, Manchester 5, Stoke-on-Trent 4, Bristol and Barnsley each 3.

The number of stillbirths notified during the week was 301 (corresponding to a rate of 43 per 1000 births), including 46 in London.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt. M. Barton to be Surg. Lt.-Comdr.

The following appointments are notified: Surg. Lts. L. J. Corbett to *Royal Oak*, and S. Jenkinson to *Lupin*.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Sub-Lt. A. J. W. Beard to be Surg. Lt.

Surg. Lt. D. M. Craig is appointed to *Warspite*.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. G. Ormrod retires on retd. pay.

Lts. J. J. O'Dwyer and S. R. M. Mackay to be Capts.

Lt. (on prob.) T. M. Corcoran is confirmed in his rank.

A. Macdonald to be Lt. (on prob.) and is secd. under the provisions of Art. 213, Royal Warrant for Pay and Promotion.

ARMY DENTAL CORPS.

Lts. A. K. Inglis, W. McD. Birse, W. P. Baxendine, and N. I. Macmillan to be Capts.

TERRITORIAL ARMY.

Capt. E. J. B. Sewell, from R.A.V.C., T.A., to be Lt.

D. B. Purves (late Cadet Offr., Edinburgh Univ. Contgt., Sen. Div., O.T.C.) to be Lt.

ROYAL AIR FORCE.

R. N. Kinnison is granted a Short Service Commission as a Flying Officer for three years on the Active List.

RESERVE OF AIR FORCE OFFICERS.

Flight Lt. R. F. T. Grace ceases to be employed with the Regular Air Force.

INDIAN MEDICAL SERVICE.

Lt.-Col. F. J. Kolapore retires.

Lt. H. N. Dewan relinquishes his temp. commn.

GUY'S HOSPITAL: ANNUAL REPORT FOR 1930.—Last year the record number of 12,249 in-patients were treated, an increase of about 450. Their average stay was approximately 17½ days, as compared with 18 days in 1929; the average number of beds in daily occupation was raised from 553 to 563. The report regards these improvements as "visible proof of skilful medical attention and studied organisation." The average weekly cost of each in-patient was £4 15*s.* 8*d.*, a fractional reduction. There were 123,791 new out-patients; they cost an average of 8*s.* 1*d.* each, an increase of 5*d.* The rate of mortality again moved downwards, being 4·8 per cent. for all patients and 3 per cent. for surgical cases; these are the lowest recorded figures. There were 9120 administrations of a general anæsthetic, exclusive of 6618 administrations in the dental department. For five years past income has failed to meet expenditure, and in 1930, for the second time in that period, the year's deficiency exceeds £20,000. Less than one-third of the annual expenditure of nearly £200,000 is provided from endowments. That income is slowly rising, as are payments by patients, but voluntary gifts are apparently stationary, while legacies, fluctuating widely from year to year, seldom form an important feature in the year's budget.

GENERAL MEDICAL COUNCIL.

PRESIDENT'S ADDRESS.

AT the opening of the 133rd session of the Council on June 2nd, Sir DONALD MACALISTER referred to the loss to the Council and the science of medicine from the death of Prof. Lorrain Smith, representative of the University of Edinburgh; to the death of two former members of the Council, Dr. James Alexander Adams and Prof. David Hepburn; and to the honour bestowed on Sir Ashley Watson Mackintosh, representative of Aberdeen.

RECIPROCAL RELATIONS.

"The Privy Council," said Sir Donald, "have informed us that, in consequence of recent rearrangements with *self-governing Dominions* empowered to enter into independent agreements with other countries, it may be necessary to revise the terms under which, pursuant to the Medical Act, 1886, His Majesty in Council ensures to 'the registered practitioners of the United Kingdom' reciprocal privileges of practising abroad. The matter is still under consideration, but it will probably involve the revision of the somewhat diverse conditions now governing medical reciprocity both with foreign countries and with the overseas portions of the British Empire. The Union of South Africa, and the Province of Manitoba, in particular, desire that modifications in the scope of the reciprocal privileges they offer to practitioners on our Register should be contemplated in this country. Correspondence on the subject is still proceeding.

"In regard to Indian qualifications, I am able to report only that the Bill for the establishment of an All-India Medical Council, to supervise and guarantee the standards of medical education throughout that country, is still in process of drafting. It is not yet ready to be submitted to the Indian Legislature. Meanwhile, questions incidental to the general subject are calling for prompt consideration and solution, and suggest that the need for central legislation is not becoming less urgent."

PHARMACY.

"At the instance of the Government, a Poisons and Pharmacy Bill, which has passed the House of Lords, is now before the House of Commons. It gives effect, with certain amendments, to the recommendations of the recent Departmental Committee, of which I was a member, for the better regulation of the profession of pharmacy, and of the definition and classification of poisons by the aid of a statutory Advisory Board. On this Board, under the Secretary of State for Home Affairs, the General Medical Council, as the body concerned with the issue of the British Pharmacopœia, is to nominate a member. I was invited, as your President, to attend at the Home Office a conference on the Bill between the authorities and representatives of the medical profession. Explanations were given and suggestions were considered on the scope and effect of the several clauses, as bearing on medicine, and I think I may say that when the conference rose, its members were reassured that the proposed legislation was in the public interest, and free of risk to the efficient practice of medicine in any of its branches.

"The Secretary of State has communicated to the Council certain proposed new regulations, amending those of 1928 concerning dangerous drugs, and exempting from their purview certain preparations containing one of these drugs in negligible proportions. This exemption will be for the convenience of the prescriber, without giving rise to any danger to his patients."

EDUCATIONAL CURRICULUM.

In pursuance of the report of the Joint Education and Examination Committees, Sir Donald said he had written to the Minister of Health calling attention to the desirability of making further accommodation available for the teaching of practical obstetrics to medical students. The Minister had sent a sympathetic reply, which had been referred to the Joint Committee, which had been considering this subject and the place of preventive medicine in the medical curriculum.

In 1922 the Council issued revised recommendations on the course of study and examinations to be required of candidates for degrees or licences in dentistry and dental surgery. These had been generally followed by the licensing bodies, but it appeared that certain expressions in the recommendations were so ambiguous or ill-defined that widely varying interpretations had been put upon them. A need had thus arisen for greater uniformity of standard in reference to the requirements for dental qualification, particularly as regards such general subjects as anatomy, physiology, pathology, medicine, surgery, hospital practice, and the like. It was, said Sir Donald, the duty of the Council, under Section 22 of the Dentists Act, 1878, to seek and to procure precise information "as to the course of study and examinations to be gone through to obtain" dental certificates and licences, "and any person or persons deputed for this purpose" by the Council "may attend and be present at any such examinations." The Dental Education and Examination Committee reported that in their opinion the time had come to make detailed inquiry into the working of the Council's recommendations, and that for this purpose the Council should now authorise the appointment of one or more deputy-visitors of the dental examinations.

OVERSEAS STUDENTS.

The Committee on Foreign and Colonial Students had brought into operation the method approved by the Council last November for dealing with applications from students from the United States for permission to pursue medical study in British schools. A regular interchange of evidence and certificates between the American authorities and the Council had been arranged, and the information forwarded from America had been singularly definite and helpful. It had enabled medical schools and licensing bodies to check and decide upon applications with full knowledge of the qualifications and eligibility of candidates for admission, and had been welcomed by deans and other authorities on this side. It had also contributed to a better international understanding between the medical bodies in the two countries, and to the maintenance of the standards of medical education.

COMMITTEE WORK.

The Pharmacopœia Committee had received an encouraging report on the progress made by the Pharmacopœia Commission in the drafting of the new British Pharmacopœia. The draft text was being printed, and proofs of a considerable portion had been received. But much remained to be done, and it was now doubtful whether the hoped-for issue of the new volume could be completed this year. The audited accounts for 1930 showed that the finances of the Council as a whole, in spite of heavy expenditure on the visitation and inspection of examinations, and on the preparation of the new Pharmacopœia, were in a satisfactory condition, and the anticipated surplus had been restored.

PROPOSED ENLARGEMENT OF THE COUNCIL.

The Representative Body of the British Medical Association had forwarded an expression of their opinion that the time had come for the addition to the Council of a fifth representative of the registered medical practitioners in England and Wales, and the request that the Council should take appropriate steps to this end. Section 10 of the Medical Act, 1886, said Sir Donald, empowered the General Council to represent to the Privy Council ". . . that it is expedient to confer on the registered medical practitioners resident in any part of the United Kingdom the power of returning an additional member to the General Council." One such application was made in 1909, and was granted by the Privy Council in August *of that year, and they were informed that this application* did not exhaust the powers of the Council under Section 10 (c). The General Council must decide the question itself. Under Sections 6 and 9 of the Medical Act, 1858, it could not delegate the application to the Branch Council for England or the Executive Committee.

The President also alluded briefly to the forthcoming centenary of the Leeds School of Medicine, to the duties of medical practitioners in regard to cremation, and to the large entry on the Register of new practitioners (1490) and medical students (1792), the numbers being the highest for some years.

At the conclusion of his address a vote of thanks was proposed by Sir Holburt Waring and seconded by Sir Norman Walker. The appointment of Dr. Sydney A. Smith as representative of the University of Edinburgh was announced. The Council then passed to the consideration of disciplinary cases.

HUGHLINGS JACKSON MEMORIAL FUND

FURTHER *subscriptions to this fund have been* received from Dr. Willoughby Lyle, Dr. W. R. Bett, Mr. Holmes Spicer, Dr. J. A. Arkwright, Dr. Foster Kennedy (New York), Dr. Percy Smith, Mr. R. R. James, Dr. H. L. Tidy, Dr. Batty Shaw, Dr. Nathan Raw, Dr. F. J. Nattrass, Sir J. Herbert Parsons, Mr. Ernest Clarke, Dr. Donald Core, Dr. Hinds Howell, Dr. G. M. Griffiths, Dr. F. L. Golla, Dr. Bernard Hart, Dr. Seymour Davies, The Osler Club, and Prof. Otfrid Foerster (Breslau). The fund now amounts to nearly £900, towards the £1200 required.

BIRMINGHAM CRIPPLES' HOSPITAL: ANNUAL REPORT. Although there was last year an increase in the number of patients, many of the cases required shorter treatment, particularly among the children. The annual report points out that this improvement is to a great extent attributable to those voluntary organisations which have roused public opinion so that health and education committees throughout the country are pledged to see that adequate arrangements exist in their areas for the orthopædic treatment of children. The general improvement in public health services also has made for the earlier ascertainment and consequent earlier treatment of the cripples. The waiting-list is, however, longer than ever. Patients paid £3388, often in small weekly instalments. The income was £30,153, which came within £747 of the expenditure.

OBITUARY

SIR HERBERT WATERHOUSE, M.D. Edin., F.R.C.S. Eng.,

CONSULTING SURGEON TO CHARING CROSS HOSPITAL.

THE death of Sir Herbert Waterhouse on May 23rd deprives the medical profession of a well-loved surgeon and clinical teacher whose name had been associated with the Charing Cross school for more than 30 years. Until the spring of last year, when he was the victim of a motor accident, he had always enjoyed the best of health. He was walking near his own door when two motor vehicles in collision drove on to the pavement and pinned him against the railings, causing injuries which rendered him unconscious for over two hours and, as the sequel showed, inflicted damage on his spine. He made a good recovery and was able to enjoy his usual fishing holiday in the late autumn. But early in the present year he developed symptoms of spondylitis in one of his lumbar vertebræ which crippled and disabled him. Death came suddenly as the result of pulmonary embolism.

SIR HERBERT WATERHOUSE.

[*Photograph by Thos. Fall.*

Herbert Furnivall Waterhouse was born in London in 1864, the son of the Rev. C. J. Waterhouse. He received his medical education in the University of Edinburgh, where he graduated M.B., C.M., with distinction in 1887, and two years later as M.D. when his thesis was awarded a gold medal. After graduation he served as house surgeon in the Royal Infirmary, Edinburgh, and a year later as house surgeon to Sir William Macewen in the Royal Infirmary, Glasgow, an experience to which he always looked back with satisfaction. His academic standing in his own university and in its social life was recognised by his election as President of the Royal Medical Society. After taking the F.R.C.S. Eng. in 1890, he entered the medical school of Charing Cross Hospital as demonstrator of anatomy in 1890, and a year later was elected on the staff as assistant surgeon. The remainder of his professional life was given whole-heartedly to this school and hospital: to the school as lecturer on anatomy 1897–1901, and as dean 1901–1906; to the hospital as assistant surgeon 1891–1903, as surgeon 1903–1929, and thereafter as consulting surgeon. His other chief hospital interest was as surgeon to the Victoria Hospital for Children, Chelsea, of which he was a zealous officer for many years.

Waterhouse's influence upon surgery at Charin Cross was great, and his work there was an inspiratio to many a student to take up the practice of surger in earnest. It was, indeed, a well-founded boast tha three of his house surgeons had been appointed t the surgical staff. As a surgeon, writes Mr. Norma Lake, he was rapid and dexterous, impatient of dela and incompetence, quick to distinguish the usefu from the valueless innovation, sometimes ove enthusiastic, always brilliant, and, as a corollary o such a temperament, with little capacity for sustaine interest or tedious hackwork. He was largel responsible, through a paper published with W. S Fenwick in 1910, for the introduction into thi country as a routine of the iodine method of ski preparation. Only those who remember how irksome and complicated were the methods previously i use will appreciate the immense saving in time and material the newer method brought about. Some years before this, while in Germany, he had carried out fruitful research on streptococcic infections o the peritoneum and the importance of the *locu resistentiæ minoris.* It was in diagnosis, however, that his talents best appeared. Trained in the older clinical school, before the radiologist and biochemist could give much help, he had developed what for lack of complete analysis we still have to call surgical instinct. Those who worked with him could relate many cases in which an apparently astounding diagnosis was made only to prove correct on the operating table, or where a refusal to operate, upon no obviously sufficient grounds, was followed shortly afterwards by the patient's death from some inevitable cause which surgery could not have prevented. Another of his pupils, Mr. Jennings Marshall, writes of his intensely practical faculty of fixing on the essential and conclusive, and disregarding the inessential. The same power made him a superb abdominal surgeon particularly in acute cases—in these his results were unrivalled. His was always the direct, straightforward method; he had mastered the secret of knowing when to stop. For anything tedious or involving finicky attention to detail he had little patience, nevertheless in vital points of operative technique he was meticulous and his work was neat and quick. It was a great pity he could not be induced to place on record his rich clinical experience, for there is no doubt that he could have written in an arresting manner and with a freshness of viewpoint given to few.

As a teacher of both systematic and clinical surgery he excelled. His lectures, always full of anecdote, were for that very reason well remembered long after more formal teaching had faded into uncertainty. Yet, Mr. Lake adds, it will be not so much for his abilities as a surgeon and teacher that he will be long remembered as for the enthusiasm he was able to inspire in others and for the helpful encouragement he gave to his juniors. His popularity rested upon more than his abounding geniality; it depended primarily upon a deep-seated appreciation of his abilities, of his enthusiasms, even of the occasional inconsistencies which rendered his personality the more attractive, and of his unstinted help to all those who found themselves in difficulties whether technical, tactical, or ethical. Very few teachers and chiefs, Mr. Marshall says, can have had more influence in getting the best out of his subordinates and in spurring them on to effort; indeed, if Sir Herbert had made up his mind on a certain course for one of his men, there was little peace until this was adopted. His help was available, however, far more than in a professional sense, and to all whom he had taken under his wing he was guide, philosopher, and friend, prepared to smooth out troubles and bothers. He was constantly being appealed to for advice and help, and as constantly acting as peacemaker.

During this period of his life Waterhouse was a member of the council of the Royal College of Surgeons and of its court of examiners; he examined in surgery at the Universities of London, Manchester, Birmingham, and Liverpool. These were to him not mere duties; he took pride in the academic successes of the candidates. He was also President of the Clinical Section of the Royal Society of Medicine. Early in the war he became associated with a remarkable enterprise. Queen Alexandra, hearing that the Russian Army was deficient in hospital equipment, appointed a committee to collect funds for a hospital to be sent to Russia to assist the army on the Eastern front. This Anglo-Russian Hospital was put under the charge of Lady Muriel Paget as organising secretary, Dr. Andrew Fleming as commanding officer, and Waterhouse was appointed the principal surgeon. The unit proceeded to Petrograd in December, 1915, where with the help of Russian doctors and nurses the hospital was started in the wing of the Grand Duke Demetri's palace with accommodation for about a hundred patients. In the following summer a field hospital was also commissioned and sent to the front attached to the Imperial Guards and under the command of the famous General Brusiloff. During the summer this hospital took part in his attack on the Austrian Army, which was so successful that nearly 400,000 prisoners were captured. The difficulties experienced by the organisers of the hospital were enormous, and it was due to Waterhouse's experience and discretion that they were to a large extent overcome. One of his surgical colleagues writes: "Always cheerful and hopeful under the worst conditions he gave encouragement to everyone around him. With the able assistance of Dr. Fleming the hospital created a good impression and soon became popular. Waterhouse was recognised as a surgeon of outstanding ability. Speaking French fairly fluently and in time acquiring a certain amount of the Russian language, he was an admirable chief in a very fine unit. To the Russian wounded he was always sympathetic and they accepted his advice without hesitation." He remained with the hospital for about a year, most of the time in Petrograd, after which he returned to England because he found that there was not enough work in Russia. Largely as a reward for his services in this hospital he received a knighthood.

In his later years Sir Herbert Waterhouse became closely associated with the work of the Medical Defence Union of which he had been a member since 1894. He was elected a vice-president in 1922 and president in 1925. The council of the Union, in making itself widely representative both of important medical schools and of the manifold specialties, had increased in numbers to such an extent that under a weak chairman its meetings might have become protracted and inefficient, but in managing the discussions Waterhouse showed the tact and decision required to cut short irrelevance without ever unduly pressing his own view. Everyone with a well-considered point to bring forward got a fair and courteous hearing and knew that he would get it. And his conduct in the chair was only a small part of Waterhouse's value to the Union. In constant conferences with the officers, in frequent personal interviews with such members as might be receiving the advice and assistance of the Union, in arranging for the best expert evidence on behalf of members attacked in the courts, and in whole-hearted devotion to every aspect of the Union's work, including that of finance, he expended time and energy ungrudgingly. True he took a never-ending delight and interest in the work, but none the less the whole profession owes his memory a debt of gratitude for labours which have benefited directly or indirectly all who practise medicine.

Amid these various professional interests Sir Herbert Waterhouse took an equally keen interest in other aspects of social life and enjoyments—e.g., in his relaxations as an angler and in the friendships which he formed with those of literary, journalistic, and theatrical tastes at the Savage Club, where his loss will be deeply felt. In 1892 he married Edith Florence, daughter of J. G. Harker, of Middleton, St. George, Durham. Lady Waterhouse died in 1929, and he is survived by two daughters.

HENRY JOHN BLAKESLEY, F.R.C.S.Eng.

Mr. H. J. Blakesley, who died on May 16th at the age of 73 years, was consulting surgeon to the Leicester Royal Infirmary. A student of Queen's College, Birmingham, and University College, London, he qualified in 1880 and went to Leicester as assistant medical officer to the Leicester and Rutland Asylum. Surgery was, however, from the first his aim and he gave up asylum work for general practice, with appointments as surgeon to the Provident Dispensary and the Wyggeston Hospital. In 1889 under the tutorship of the late Mr. Charles Stonham he took the F.R.C.S. Eng. and joined the surgical staff of the infirmary. After serving his time as assistant and full surgeon, instead of retiring from public work he accepted charge of the male clinic for venereal diseases. Here his attention to detail and kindly sympathetic manner attracted a large number of patients, of whom but few defaulted. Dr. Christopher Rolleston writes of the disappointment which he felt that so few of his colleagues availed themselves of the extensive material available for study in the clinic, but when practitioners did come they were sure of a welcome and ample opportunities of acquiring clinical and manipulative skill. He was specially interested in the technique of the treatment of syphilis. Most of the injections of "606" were given by him or under his direct supervision. He adhered to the gravity method which implies much expenditure of time, and had remarkably few cases of dermatitis or jaundice. As regards gonorrhœa, he applied tests of cure of a stringency rarely found elsewhere than in America or Germany. Colonel Blakesley died, Dr. Rolleston adds, as he had wished, in the hospital and wards he loved so well, quite suddenly without anguish, loved and respected by all.

WILLIAM DOBINSON HALLIBURTON,
M.D., F.R.C.P.Lond., F.R.S.,

EMERITUS PROFESSOR OF PHYSIOLOGY, KING'S COLLEGE, LONDON.

Prof. Halliburton, whose death on May 21st was announced in our last issue, will be remembered as one who helped to build medicine firmly on a basis of exact science. In days when chemists who were alive to the biological bearings of their science were much rarer even than the physiologists working on the chemical side of theirs he, like Gamgee in Manchester, upheld in London the importance of the chemical study of physiology, in the years just before the organic chemists led by Emil Fischer began systematically to explore biological fields, and before physical chemistry had come to be a specialised science or its biological applications been appreciated. His book on chemical physiology marked an era. It kept alive through dark laborious years the fire that has blazed up since so brilliantly, and no one in England had greater cause for pride in the justification of the faith to which he devoted his life. Physiology in England owes a debt to Halliburton which the Physiological Society has endeavoured to convey in the affectionate esteem with which it has regarded him for more than 40 years.

William Dobinson Halliburton was born in London on June 21st, 1860, the son of Thomas Halliburton, of Upper Norwood. He was educated privately and at University College School, under the headmastership first of T. Hewitt Key and then of H. W. Eve. In October, 1877, he entered University College as a science student, later transferring to the study of medicine and graduating B.Sc. in 1879, M.B. in 1883, and M.D., qualifying for the gold medal in 1884. He then held several resident posts at University College Hospital, but was soon diverted by the teachings of Burdon Sanderson and Schäfer into the attractive byways of physiology. He had been Sharpey physiological scholar at University College and in 1885 was awarded the science research medal and the Fellowship of the College. In 1887 he became assistant to Schäfer in the chair of physiology, a post which he resigned three years later when he succeeded Gerald Yeo in the corresponding chair at King's College. During this period he was also lecturing on physiology at the London School of Medicine for Women.

PROF. HALLIBURTON.

[*Photograph by Elliott and Fry.*

At King's College (in the words of his successor, Prof. R. J. S. McDowall) Halliburton gathered round him a number of able investigators—Brodie, Locke, C. J. Martin, Rosenheim, Da Fano, to name but a few—and many men now most distinguished clinicians were his pupils. He came particularly in contact with Ferrier and Mott, and there is little doubt that in some part this association was responsible for his making a special study of the chemistry of nervous tissues. It is interesting to remark that it was his researches, and those of Rosenheim in his laboratory, which led to the discovery that cholesterol might contain as impurity ergosterol, in which we now know vitamin D is developed under the influence of ultraviolet light. In these researches there is an untapped mine of knowledge still to be drawn upon in the interests of medicine. His biochemical laboratory—improvised in a corridor, and the first in London—rapidly became the Mecca to which large numbers of young biochemists came for instruction and inspiration. His early work was largely in relation to the biochemistry of the proteins of muscle and blood. For this work he was made a Fellow of the Royal Society in 1891. In the nature of things many of his discoveries have passed from current knowledge, but they will ever stand as essential stepping-stones in the advance of knowledge of the subject. He did not, however, confine himself strictly to biochemistry. With W. E. Dixon he carried out researches on the cerebral circulation and the cerebrospinal fluid. He was one of the founders of the Biochemical Society, of which he was the only honorary member.

Of Halliburton's relations within the College, something was told at the memorial service by a former colleague, Prof. E. Barclay-Smith. There was never, he said, a more devoted friend, a more loyal supporter of King's than Halliburton. Service to the college was his life and in many ways he was the life of the college. All who knew him will agree that he simply radiated sympathy, gentleness, and kindness. He was never known to speak unkindly of or to a colleague. In the many meetings over which he presided he would often listen with the utmost patience to a colleague with whose opinion he might differ, but never by look or word would he give pain to his opponent. For many years he served as dean of his faculty and from the day that Halliburton admitted a student he had the supreme gift of making that student feel that the dean was his friend, his confidant, his ever ready and constant help in time of trouble.

As a writer the name of Halliburton has become a household word in medicine and its allied sciences. Although he did all his writing with his left hand there is no internal evidence that his pen did not always run freely. The text-book of physiology which now bears his name has had a truly remarkable career. It was in 1848 that William Senhouse Kirkes, with the assistance of James Paget, brought out a handbook of 705 pages, expanding and revising the treatise by Johannes Müller then in vogue. The volume was (in a reviewer's words) lucid, precise, plain, and practical, and for 52 years and 13 editions it was associated with St. Bartholomew's Hospital and editors such as Savory, Morant Baker, Vincent Harris, and Klein. In 1896, on the advice of Sir William Gowers, Mr. John Murray asked Halliburton to take it over and under his guidance another 13 editions appeared in the next 21 years. Six more editions brought up the total number of copies issued to more than 125,000. And the book remained, as it started, lucid, precise, plain, and practical. No other medical text-book has shown such perennial youth and vitality. But Halliburton's greatest work was undoubtedly the Text-book of Chemical Physiology and Pathology which first appeared in 1891, a volume of 874 pages with 104 illustrations. The title was "chemical physiology" rather than "physiological chemistry," for it was Halliburton's aim to deal with the subjects from the point of view of their function in the body rather than from that of their chemical relationship one to another. This book became at once the vade-mecum of all who were trying to solve the problems of pathology from the side of chemistry. In his Essentials of Chemical Physiology he was successful in compressing into one handy volume all

(*Continued at foot of opposite page.*)

CORRESPONDENCE

ADEQUATE TREATMENT OF SYPHILIS.

To the Editor of THE LANCET.

SIR,—Colonel Burke, in his article on this theme in your issue of May 23rd (p. 1127), assesses my influence on current practice in the treatment of syphilis much too highly. I have never flattered myself that any reader would accept my dicta without question, and have tried always to present the evidence with the argument so that the reader could form his own judgment. I have no wish to engage in a polemic with Colonel Burke, and write now only in order that the issue between those who advocate the practice of giving mercury or bismuth in the same course, and those who advocate first the administration of a course of arsenobenzene, then a course of mercury or bismuth, and so on, may be made clear. In both schools are workers whose opinions command the greatest respect, and I would ask the reader not to judge solely by what is said by either Colonel Burke or myself, but to refer to the original papers from which we have derived our evidence.

With regard to the respective merits of our different plans of treatment, apart from the question of neuro-recurrence, perhaps it would be best to reserve judgment until the results of the League of Nations analysis of case records has been published, and I would confine the issue here to whether or not the administration of arsenobenzene preparation alone in the first course of treatment of an early case of syphilis conduces more to the settlement of *Sp. pallida* in the central nervous (including the meningo-vascular) system, than does the practice of ensuring during the first course that mercury or bismuth is more or less constantly in circulation. I have presented evidence that it does in an article published in the *Practitioner* for February, 1931 (of which, so far as the supply will permit, I shall be glad to send a reprint to anyone interested), and in other publications, including No. 132 of the M.R.C. Special Report Series. Alurralde and Sepich, in a paper summarised in *Bulletin of Hygiene* (1930, v., 77), attributed the great increase in frequency of neuro-syphilis in Buenos Aires to the exclusive, or almost exclusive, use of arsenobenzene preparations. Against Colonel Burke's suggestion that the difference between his experience and that of Moore and Kemp in respect of neuro-recurrences may be due to his use of bismuth instead of mercury, and to the use of "606" by Moore and Kemp, is the fact that very many thousands of soldiers were treated during the war by a course of "606" and mercurial injections, and this admittedly inadequate according to present-day standards, yet the cases of clinically manifest neuro-recurrence discovered in them afterwards was negligible (see *Brit. Jour. of Venereal Diseases*, April and July, 1925).

Colonel Burke quoted an extract from Moore and Kemp's article in which it was stated that "it is absolutely unsafe to permit a patient with primary or secondary syphilis to pass a single day without the influence of a treponemicidal drug." This appears to me to favour the concurrent use of mercury or bismuth with the arsenobenzene preparation during at least the first course, because the experimental evidence is that even "606" is excreted so quickly that when it is used alone the patient is not under the influence of a treponemicidal drug for some days in each week of a course. The argument seems to apply with greater force to "914," the excretion of which is much more rapid than is that of "606," but perhaps Colonel Burke has evidence that stabilarsan is excreted more slowly. Colonel Burke states that there is no difference between our two lines of treatment in respect of clinical neuro-recurrence. This is true, but in Report No. 132 I suggested that for every case presenting clinical signs of neuro-recurrence there must be a number with only changes in the cerebro-spinal fluid, and in my other article I quoted some results of examinations of cerebro-spinal fluid by R. Bernard, which, so far as they go, support this view.

I am, Sir, yours faithfully,

Eccleston-square, S.W., May 30th. L. W. HARRISON.

To the Editor of THE LANCET.

SIR,—In reference to Dr. Tytler Burke's article may I make some comment on the section headed Therapeutic Economy. In the first place, any estimate of the value of a treatment of sero-negative primary syphilis must be based on a consideration of the blood and cerebro-spinal fluid five to ten years after infection in cases where reinfection is practically excluded. Dr. Burke has not observed his cases long enough, or adequately enough, to make more than an estimate of probable cures, and so his claim for 100 per cent. cures cannot be admitted. Colonel Harrison has made no such claim of 100 per cent. cures.

In the second part of this section Dr. Burke claims that his course has an efficiency index of 92, as compared with 79 for the St. Thomas's course. These numbers are based on computations and theories, about which may I put forward the following observations:—

(1) The relative therapeutic—i.e., spirochæticidal—value of a compound, although it very roughly varies with the chemotherapeutic index, does not do so in a mathematical manner, or, at any rate, this has not been shown. A much sounder mathematical expression of therapeutic value would be obtained by giving the inverse of the average time of disappearance of spirochætes from a lesion on exhibiting a standard therapeutic dose of the compound. Thus, supposing a dose of 0·011 g. arsenobenzene per kilo causes disappearance of spirochætes from a lesion seven days after infection in one day, and a dose of 0·006 g. per kilo of bisoxyl produced disappearance in similar cases in four days, then the chemotherapeutic value of arsenobenzene would be 1, and that of bisoxyl 0·25, instead of 0·5 (according to Dr. Burke's theory).

(2) A course cannot be judged on the intensity of therapeutic action taken as the average intensity per course, since some—e.g., Colonel Harrison—prefer a maximum intensity during the first three weeks with a long stretch of slighter intensity instead

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(Continued from previous page.)

that would be likely to help the student or young practitioner in his approach to medicine from the biochemical side. Of special interest further were his Croonian lectures on the biochemical side of nervous activity, delivered before the Royal College of Physicians in 1901. In 1916 Halliburton was asked by the Physiological Society to take over the editorship of *Physiological Abstracts*, which in his hands became firmly established as a periodical of international importance.

of an even course of moderate intensity during a shorter period (Dr. Burke).

(3) According to Dr. Burke's theory a dosage of 0·45 g. stabilarsan per week is equivalent in spirochæticidal action to one of 0·6 g. per week, or, one supposes, of 0·9 g. per week. Each is considered to be one therapeutic unit. There can be few who had experience of the relative efficiency of large and small doses of salvarsan who would dream of accepting such an opinion.

(4) Dr. Burke's theory, although it apparently stresses the time factor, makes no real distinction between the heavy bombardment of spirochætes in a period of 48 hours or so by the intravenous arsenobenzols, and the continuous slow-fire of the bismuth over a period of a week or more. Good generalship demands a suitable combination of bombardment and slow-fire which is unrepresented by the figures in Dr. Burke's scheme.

All these considerations lead me to believe strongly that an evaluation of net therapeutic efficiency cannot be made by any very simple scheme, and also that Dr. Burke's scheme is definitely unsound.

I am, Sir, yours faithfully,

HOWARD ALLEN,

Assistant Medical Officer (V.D.), St. Thomas's Hospital.

May 29th, 1931.

To the Editor of THE LANCET.

SIR,—Dr. Burke is protagonist of what he calls the alternating regimen in the treatment of syphilis. He supports his arguments by an analysis of some 136 cases of sero-negative primary cases who have completed this alternating regimen, which he considers necessary to cure an early case. Most clinicians will be unable to accept an opinion based on so small a number of cases observed for an inadequate period. Further, in sero-negative primary syphilis it is well known that a small quantity of either arsenobenzol or bismuth is sufficient to produce an apparent cure. While I am averse to entering into a controversy on the relative merits of different forms of treatment, because many different methods are effective in attaining a cure, there are statements in Dr. Burke's article which, though plausible, have not been proved. There are also many statements which are not in accord with my clinical experience.

In our work here extending over a period of 17 years, the incidence of complications following on "concurrent treatment" with arsenobenzol derivatives in combination with bismuth or mercury has been extremely low. Some individuals are intolerant of arsenobenzol and bismuth preparations no matter what scheme of treatment is adopted. There are many factors which enter into the production of intolerance other than the drug(s) employed—e.g., septic foci, alcoholic indulgence. The periods of rest from treatment which Dr. Burke seems to deprecate are not provided to allow the patient to recover "from the toxic effects of the remedial agents administered." Experimental work and clinical experience show that arsenobenzol, bismuth, and mercury are cumulative in their effect and that a certain amount of the drug is not immediately absorbed but is stored in the tissues. The temporary rest from treatment allows the tissues to use up or eliminate the residue deposited in them.

Dr. Burke makes reference to nephritis as a common manifestation of intolerance in concurrent treatment. In our experience of close on 40,000 injections per annum it is one of the rarest complications. The production of Wassermann-fast cases is stressed as an argument against concurrent treatment. In cases of sero-negative syphilis, which Dr. Burke quotes, Wassermann-fast cases should be unknown. In generalised syphilis, with active florid lesions, a quite undue prominence is often given to Wassermann-fast cases; they are, in our experience, very rare if the patient is treated on the concurrent method. Dr. Burke's statement on "the mode of action of arsenobenzol compounds and of bismuth" is merely postulating a theory. There is no accepted scientific proof that bismuth, when injected into the body, produces a toxalbumin. The weight of experimental evidence tends rather to suggest that the mechanism of the action of bismuth is essentially similar to that of mercury, and is dependent on the ease with which the Bi-ions become dissociated, the latter being responsible for the spirochæticidal action. There is no proof that, as in the case of the arsenobenzol compounds, complex oxidation products, which are spirochæticidal, are produced. Clinical evidence also points to bismuth and mercury acting in a similar manner both in the production of toxic symptoms and in their therapeutic effects. Dr. Burke's statement that "mercury is inefficient and a mere waste of time" is not in accord with the experience of most clinicians. In conjunction with arsenobenzol it has resulted in a cure of many cases of syphilis, and in cases of late and latent syphilis there is still ground for thinking that it has a place in the therapy.

Under the heading of Therapeutic Economy Dr. Burke's attempt to calculate the theoretical efficiency of any one drug is misleading. No mathematical formula can take into account (1) the individual resistance of the patient, (2) the virulence of the infection, and (3) the many intercurrent factors such as focal sepsis, the behaviour of the patient, intercurrent illness, &c., which influence the course of the disease. The chemotherapeutic indices which Dr. Burke chooses to adopt for the respective drugs are arbitrary figures; there is no evidence, based on the treatment of human syphilis, to substantiate them, and animal experimentation is not always a reliable guide. No account is taken of the stimulation of natural immunity by the arsenobenzol preparations.

The success of treatment depends, in our opinion, more on a study of the needs of each individual patient and how far one caters for these needs. The same applies to defaulting from treatment. It is not so much how long a patient is asked to attend; it is more the power of the medical attendant to impress on him the need for continuity of treatment.

In his attempt to make out his case Dr. Burke has collected a series of assumptions and from these he lays down dogmatic rules of treatment. But what scientific proof is there:—

(1) That "606" has a greater traumatic toxic effect on nervous tissue than "914" and so predisposes to neurosyphilis?

(2) That mercury is inefficient and a mere waste of time?

(3) That the figures which he gives as the chemotherapeutic index for arsenobenzol compounds, bismuth, mercury, tryparsamide, &c., are applicable in human syphilis?

(4) That arsenobenzol compounds and bismuth act on the same "productive mechanism of the body" in the same way, or, even if we admit that they do so, that this mechanism is ever exhausted when reasonable therapeutic doses of each is given?

There is undoubted clinical evidence in support of the synergistic effect of drugs in other fields of medicine, and I fear that the tone of Dr. Burke's contribution will lead to confusion in the minds of readers who do not appreciate that many of his statements are mainly theory and not accepted *clinical* facts. It is possible to standardise a laboratory test; it is not possible, nor it is advisable to try, to standardise the treatment of a disease. There is the recognised necessity of treating the patient rather than the symptoms.

I am, Sir, yours faithfully,
DAVID LEES, M.B., D.P.H., F.R.C.S.,
Edinburgh, June 2nd, 1931. F.R.C.P. Edin.

THE CLEAN MILK PROBLEM.

To the Editor of THE LANCET.

SIR,—Many of us who are interested in the milk problem are much in sympathy with the letter of Dr. Stenhouse Williams and agree with it up to a point. While the work he cites on the nutritive side is interesting, nothing is said as to the weight of evidence on the other side, and my remarks "I do not think that its opponents have demonstrated, when efficiently performed, that it (i.e., pasteurisation) does any material damage to any known nutritional factor in milk, but the last word has not been said on this side and our knowledge is admittedly incomplete" are a fair statement. The recently issued Memorandum of the Ministry of Health[1] puts it much stronger and states as regards pasteurisation "Milk so treated appears to retain its valuable food properties practically unimpaired." But by all means let us have more studies of the nutritional values of different types of milk.

When Dr. Williams asks that any new legislation shall ensure the progress of the production of a clean milk which is free from disease it is not clear for what he is asking. My proposals advocate giving powers to the larger urban areas only to permit efficiently pasteurised milk or milk from herds certified free from tuberculosis and produced under cleanly conditions to be sold. The second group is surely what Dr. Williams wants to encourage. He evidently fears that the alternative provision of pasteurised milk will not encourage their multiplication. Here I do not agree, but in any event, their numbers are negligible now, except in the Reading area, and their rate of increase is of the slowest. If Dr. Williams and his colleagues can demonstrate the inferiority of pasteurised milk, that will be an excellent impetus to their production.

Behind these points is the old contention that any widespread system of pasteurisation will put back the clock as regards the production of clean milk. I think this is a probable and undesirable result and the evil should be minimised so far as possible. The operations of my proposals in their restricted and controlled form will do a good deal in that direction. The real answer, however, is to put the question—What is the alternative? Are we to continue indefinitely as at present with extensive infection of the milk-supply by tubercle bacilli, with no constructive scheme operating for the elimination of tuberculosis amongst our dairy cattle, with the risk and the actuality of milk-borne outbreaks of infectious disease (such as the extensive Hove-Brighton outbreak), with enormous numbers of bacteria as the normal contamination of our milk, with the agricultural interests failing to coöperate in the enforcement of the Milk and Dairies Order and indeed often actively retarding its enforcement, and with a material proportion of our milk-supply pasteurised by methods which are both undisclosed and unreliable in their operation? Dr. Williams will no doubt reply that there have been great improvements. There may be in the Reading area, and we all admire the magnificent educational and scientific work done by him and his colleagues there. Unfortunately it does not apply to the country generally, and does not affect the truth of the above statement. Like him, I should prefer to see provided a clean safe pure milk-supply without any heat treatment: but it is not in sight.

The large urban areas have no efficient means of safeguarding their milk-supply, and in view of the continued failure of the agricultural side to put their house in order, it seems reasonable to give them the opportunity of protecting it in the way I have indicated. I welcome measures to extend the number of herds free from tuberculosis and believe that financial assistance to that end is wise and necessary. With encouragement it should be possible to assure that an appreciable proportion of the milk sent to our cities is from such herds.

I am, Sir, yours faithfully,
May 26th, 1931. WILLIAM G. SAVAGE.

APLASTIC ANÆMIA.

To the Editor of THE LANCET.

SIR,—The interesting case of aplastic anæmia recorded by Dr. W. J. Fenton and Dr. A. Turner in your issue of May 30th (p. 1188) prompts me to call attention to the possibility of keeping patients suffering from this condition in good health for long periods by repeated transfusions. The case of a patient of mine, now aged 36, who is still alive and active six years after the onset of the disease, is recorded by Dr. R. Stewart-Harrison in the April number of the *Guy's Hospital Reports.* His blood picture is that of aplastic anæmia with a very low white count, and his hæmoglobin percentage has been as low as 23. The gastric secretion is normal, there is no glossitis, occult blood is absent from the stools, and there are no nervous symptoms. Very large doses of liver, stomach, and iron have no effect. The patient has, however, been kept in sufficiently good health to carry on his duties as a bank manager by means of regular transfusions, which maintain his hæmoglobin percentage between 70 and 90. On one occasion, as a result of eight transfusions given in 18 days, his hæmoglobin rose from 60 to 101 per cent. He has had 109 transfusions of a full pint since 1927, and so long as he continues to be transfused about once a fortnight there seems no reason why he should not remain in good health and full activity.

I am, Sir, yours faithfully,
New Lodge Clinic, May 31st. ARTHUR F. HURST.

APPARATUS FOR ARTIFICIAL RESPIRATION.

To the Editor of THE LANCET.

SIR,—The apparatus for the prolonged administration of artificial respiration described in the last issue of THE LANCET strikes me very forcibly as being an elaboration of an apparatus I saw at the White City in the period between 1904 and 1910. I cannot say the precise year. A fishery exhibition was in progress, and this apparatus was in charge of a venerable clergyman, who was interested in fishing companies and fishermen generally. It consisted of a plate glass case with a hole in one end, closed partly by a rubber collar; it had an air pump attached to the other, by means of which air could be pumped into the case. There was a specially made Japanese

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[1] Report No. 63, Bovine Tuberculosis in Man. H.M. Stationery Office. 6d. See also THE LANCET, May 9th, p. 1037.

M.B.E. (MILITARY).

Lieut. Alexander Nicol de Gruyther, Senior Assistant Surgeon, Indian Medical Department.

Lieut. James Berchmans D'Souza, Senior Assistant Surgeon, Indian Medical Department.

First-Class Assistant Surgeon Richard Campbell Gale, I.M.S., attached Iraq Levies.

M.B.E. (CIVIL).

Jocelyn Maingard, M.D., medical officer, Mauritius.

Shivram Wamanji Patil, J.P., medical practitioner, Bombay.

Roger Pilot, medical officer, Mauritius.

HON. M.B.E.

Zahi Haddad, medical officer of health for Haifa, Palestine.

I.S.O.

Major Edward Francis Hottinger, L.M.S.S.A., civil surgeon, Punjab.

Lorens Arthur Prins, inspecting medical officer, Ceylon.

KAISAR-I-HIND MEDAL (BAR).

Henry Tristram Holland, C.I.E., F.R.C.S., Church Mission Society, Quetta.

KAISAR-I-HIND MEDAL.

Miss Hilda Keane, M.D., medical superintendent of the Victoria Zenana Hospital, Delhi.

Miss Adelaide Woodward, doctor-in-charge of American Presbyterian Memorial Hospital, Fatehgarh.

Ian Ross Anderson, M.B., medical officer in charge of Kalna Mission Hospital, Bengal.

PARLIAMENT

NOTES ON CURRENT TOPICS.

REASSEMBLING OF PARLIAMENT.

THE House of Commons reassembled after the Whitsuntide recess on Tuesday, June 2nd.

HOUSE OF COMMONS.

TUESDAY, JUNE 2ND.

Mortality Ages in British India.

Mr. Freeman asked the Secretary for India the average age of mortality, at the last known date, in British India.—Mr. Benn replied: No exact figure can be given, but in 1928 (the latest year for which materials for calculating are available) the average age was about 23 years.

Medical and Public Health Services in India.

Mr. Freeman asked the Secretary for India what percentage of revenue raised in India was spent on the maintenance of medical relief and public health services.—Mr. Benn said that for the year 1929–30 the gross revenue of British India (central and provincial) was 2,27,26,48,308 Rs. and the gross expenditure on medical and public health was 6,61,95,450 Rs., the percentage of gross revenue being 2·9.

Butter and Public Health Regulations.

Capt. Peter Macdonald asked the Minister of Health whether there was any examination of butter imported into Great Britain for sale; and what were the general regulations governing the sale of butter.—Miss Lawrence replied: The answer to the first part of the question is in the affirmative. Butter which is exposed for sale may be seized and destroyed if found to be unfit for human consumption. Samples are taken by officers of the local authorities under the Food and Drugs (Adulteration) Act and the Sale of Butter Regulations, and the vendor is liable to prosecution if there is evidence of adulteration.

Colonel Ruggles-Brise asked the Minister of Health if he would ascertain the conditions under which consignments of butter now reaching this country from Russia were produced; whether those conditions conform to the conditions required in this country; and whether he would cause samples of the butter from Russia to be analysed on arrival.—Mr. Greenwood replied: As at present advised, I do not consider it necessary to make the inquiry suggested. Imported butter is subject to examination on arrival in this country under the Food and Drugs (Adulteration) Act, and the Imported Food and Preservatives Regulations. Samples of recent consignments of Russian butter have been found on analysis to be genuine and I am having further samples examined bacteriologically.

MEDICAL NEWS

Society of Apothecaries of London.

At recent examinations the following candidates were successful in the undermentioned subjects:—

Surgery.—T. F. Davies, Guy's Hosp.; O. L. Matthews, Univ. Coll. Hosp.; C. F. Vieyra, St. Mary's Hosp.; and V. M. White, London Hosp.

Medicine.—T. F. Davies, Guy's Hosp.; B. N. Halder, Univ. of Durham; and T. L. O'C. Ryan, Univ. of Edinburgh.

Forensic Medicine.—G. I. Benjamin, Madras Medical Coll.; A. N. Coondoo, Calcutta Medical Coll. and Univ. of Durham; T. F. Davies, Guy's Hosp.; B. N. Halder, Univ. of Durham; A. E. Mathews, St. Mary's Hosp.; S. Ramarao, London Hosp.; L. B. Reeves, King's Coll. Hosp.; D. N. Ryalls, Univ. of Sheffield; H. W. Toussaint, St. Mary's Hosp.; and M. R. Tuteur-Samuel, Universities of Freiburg and Manchester.

Midwifery.—M. Belo-Zercovsky, London Hosp.; T. F. Davies, Guy's Hosp.; W. B. Mattar, St. Mary's Hosp.; T. L. O'C. Ryan, Univ. of Edinburgh; M. R. Tuteur-Samuel, Universities of Freiburg and Manchester; and C. F. Williamson, Univ. of Birmingham.

The following candidates having completed the Final Examination, have been granted the diploma of the Society entitling them *to practise Medicine, Surgery, and Midwifery*:—G. I. Benjamin, T. F. Davies, and A. E. Mathews.

Society of Medical Officers of Health.

Fever Hospitals Medical Service Group.—At the annual meeting of this group, at 1, Upper Montague-street, London, W.C., on Friday, June 12th, at 3.15 P.M., a paper on State Control of Therapeutic Substances will be read by Mr. Percival Hartley, D.Sc., of the Standards Division, National Institute for Medical Research. Visitors are invited.

Hunterian Society of London.

The Society's Medal.—The next award of this medal will be made in 1932, and is open for competition to all general practitioners of Great Britain, Ireland, and the Channel Islands. The medal will be given for the best essay on some medical subject chosen by the writers, and essays must reach the hon. secretaries on or before Dec. 31st, 1931. The president and council have decided that the medal shall be of gold and not of silver as heretofore. The rules governing the award may be obtained on application to the secretaries, Dr. D. C. Norris, 14, City-road, Finsbury-square, London, E.C. 1, and Mr. Andrew McAllister, 79, Wimpole-street, W. 1.

Local Government Medical Officers.

The annual meeting of the Association of Local Government Medical Officers of England and Wales (formerly the Poor Law Medical Officers' Association) will be held on Thursday, June 11th, at 6 P.M., at the Holborn Restaurant with Sir Arthur Newsholme, the President, in the chair. It will be followed by an informal dinner at 6.30 P.M. Any local government medical officer who wishes to be present should inform Mr. Frank Greenwood (the hon. treasurer), Bank Chambers, 150, High-street, Stoke Newington, London, N. 16.

Australian and New Zealand Medical Association in England.

The summer dinner of this association will be held at the Trocadero Restaurant, Piccadilly-circus, on Friday, June 12th, at 7.45 P.M. for 8 P.M. Mr. T. P. Dunhill will preside, and Dr. F. N. Kay Menzies will be present as the official guest of the association. All medical visitors from Australia and New Zealand, whether members of the association or not, are invited to be present. The hon. secretaries, Mr. E. T. C. Milligan and Mr. Philip Jory, may be addressed at 26, Queen Anne-street, W.1.

Medical Tour in France.

The twenty-fourth Voyage d'Études Médicales to the watering-places of France will take place this year in the western Pyrenees in the second and third week of September, under the leadership of Prof. Paul Carnot and Prof. Maurice Villaret. The party will assemble on Sept. 8th at Capvern. The principal places to be visited are Bagnères-de-Bigorre, Gavarnie, Cauterets, Lourdes, Argelès, Pau, St. Jean-de-Luz, Biarritz, Hossegor, Dax, Arcachon, Bordeaux (Faculty of Medicine and the Hospital), continuing along the coast to Royan where the tours ends on Sept. 20th. Further information may be had from Madame Juppé-Blaise, Federation of the Health Resorts of France, Tavistock House (North), Tavistock-square, London, W.C.1.

Medical Diary

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Tuesday, June 9th.—8.30 P.M., Disease in Children. Paper. Prof. A. Calmette (Paris): B.C.G. Immunisation of Infants. Epidemiology and State Medicine. Medicine. Pathology. Members of these Sections are specially invited to attend. A luncheon will be held in honour of Prof. Calmette at the Café Royal, Regent-street, London, W, at 1.15 P.M. Application should be made to Dr. A. G. Maitland-Jones, at 1, Wimpole-street, W.

Wednesday.—Surgery. Annual Provincial Meeting at the Manchester Royal Infirmary. Operating sessions. 4.30 P.M., Tea. 4.45 P.M., Cases and Specimens will be shown.

Friday.—5 P.M., Ophthalmology. Annual General Meeting. Election of Officers and Council.

HARVEIAN SOCIETY OF LONDON.

Thursday, June 11th.—3 P.M., (at St. Bartholomew's Hospital), Centenary Celebrations. Oration by Dr. Raymond Crawfurd on the Place of Medical Societies in the Progress of Medicine.

PADDINGTON MEDICAL SOCIETY.

Tuesday, June 9th.—9 P.M., (at the Great Western Royal Hotel, Paddington), Dr. G. de Swietochowski: Medical Ideals and Practice.

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY, 11, Chandos-street, W.

Thursday, June 11th.—8.30 P.M., Discussion on the Treatment of Sexual Impotence by the Methods of Individual Psychology.

SOCIETY OF MEDICAL OFFICERS OF HEALTH, 1, Upper Montagu-street, W.C.

Friday, June 12th.—3.15 P.M., Annual meeting of Fever Hospitals Medical Service Group. Mr. Percival Hartley, D.Sc.: State Control of Therapeutic Substances.

RESEARCH DEFENCE SOCIETY, 11, Chandos-street, W.

Wednesday, June 10th.—3.30 P.M., Annual General Meeting. Dr. H. H. Dale, F.R.S.: Effect of Research on Curative Medicine. (Paget Memorial Lecture.)

OPTICAL SOCIETY.

Thursday, June 11th.—8 P.M. (at the Imperial College of Science and Technology, Imperial Institute-road, South Kensington, S.W.), Sir John H. Parsons, F.R.S.: Young's Theory of Colour Vision. (Thomas Young Oration.)

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.,

Tuesday, June 9th.—5 P.M., Prof. M. J. Stewart: Precancerous Lesions of the Alimentary Tract. (Second Croonian Lecture.)

Thursday.—5 P.M., Prof. Stewart. (Last Croonian Lecture.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

Monday, June 8th, to Saturday, June 13th.—Medical Society of London, 11, Chandos-street, Cavendish-square. M.R.C.P. special evening lectures at 8.30 P.M. Tues., Dr. R. A. Young: Empyema and its Treatment. Fri., Dr. B. T. Parsons-Smith: Cardiovascular Syphilis.—Mount Vernon Hospital, Northwood (by train from Baker-street, Metropolitan, or "Rickmansworth" bus leaving Oxford-circus at 1 P.M.), Mon., Demonstration on Radium by Mr. Duncan Fitzwilliams at 2 P.M. No fee.—Central London Throat, Nose and Ear Hospital, Gray's Inn-road, Tues., Demonstration on Throat, Nose, and Ear Cases by Mr. Lowndes Yates at 5 P.M. No fee.—Chelsea Hospital for Women, Arthur-street, S.W. Special Course in Gynæcology. Mornings and/or afternoons.—Hospital for Diseases of the Skin, Blackfriars-road, S.E. Afternoon course. Tickets from the Fellowship of Medicine.—Royal Free Hospital, Gray's Inn-road, W.C. Fri., 5 P.M., Demonstration. Antenatal Treatment and Diagnosis.—Further particulars from the Fellowship of Medicine.

CHARING CROSS HOSPITAL MEDICAL SCHOOL POST-GRADUATE COURSE.

Sunday, June 7th.—10.45 A.M., Mr. L. G. Brown: Post-operative Treatment of Mastoidectomy. 11.45 A.M. Dr. C. K. J. Hamilton: Some Common Disorders of the Newly Born.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

Monday, June 8th.—10 A.M., Gynæcological Ward Visit, Genito-Urinary Operations, Skin Department. 11 A.M., Surgical Ward Visit. 2 P.M., Surgical Ward Visit. Medical, Surgical, Eye, Gynæcological Out-patients.

Tuesday.—9.30 A.M., Operations. 10 A.M., Medical Ward Visit, Dental Department. 11 A.M., Throat Operations. 11.30 A.M., Surgical Clinical Demonstrations. 2 P.M., Medical, Surgical, Throat Out-patients, Operations, Medical Ward Visit.

Wednesday.—10 A.M., Medical Ward Visit, Children's Medical Out-patients. 2 P.M., Medical, Surgical, and Eye Out-patients, Gynæcological Operations. 4.45 P.M., Venereal Diseases.

Thursday.—10 A.M., Neurological Department. 11.30 A.M., Treatment of Fractures. 2 P.M., Medical, Surgical, and Eye Out-patients, Genito-Urinary Department. Operations.

Friday.—10 A.M., Medical Ward Visit, Skin and Dental Departments. 12 noon, Medical Lecture. 2 P.M., Medical, Surgical, and Throat Out-patients. Operations.

Saturday.—9 A.M., Throat Operations. 10 A.M., Medical Ward Visit, Surgical and Children's Medical Out-patients.

NATIONAL HOSPITAL, Queen-square, W.C.

Monday, June 8th.—12 noon, Dr. Greenfield: The Cerebrospinal Fluid. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Symonds: Acute Encephalitis and Encephalomyelitis.

Tuesday.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Adie: Retrobulbar Neuritis.

Wednesday.—2 P.M., Dr. Martin: Out-patient Clinic.

Thursday.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Walshe: Cerebral Tumours (2).

Friday.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Carmichael: Birth Palsies.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE, Keppel-street, Gower-street, W.C.

Tuesday, June 9th.—5 P.M., Sir George Buchanan: International Hygiene.

Wednesday.—5 P.M., Mr. A. T. Pike: Town Planning.

Friday.—5 P.M., Sir Thomas Legge: Industrial Poisonings.

INSTITUTE OF PATHOLOGY AND RESEARCH, St. Mary's Hospital, W.

Tuesday, June 9th.—5 P.M., Prof. J. S. Haldane: The Problems of Silicosis.

CITY OF LONDON MATERNITY HOSPITAL, City-road, E.C.

Thursday, June 11th.—5 P.M., Mr. Arnold Walker: The Importance and Treatment of Hæmorrhages in Pregnancy.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

Tuesday, June 9th.—3.15 P.M., Mr. McNeill Love: The Differential Diagnosis of Abdominal Emergencies.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, Balham, S.W.

Wednesday, June 10th.—4 P.M., Dr. C. E. Lakin: Demonstration of Medical Cases.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.

Friday, June 12th.—4 P.M., Mr. W. A. Mill: Acute Suppuration in the Middle Ear.

UNIVERSITY OF BIRMINGHAM.

Tuesday, June 9th.—3.30 P.M. (at the General Hospital), Prof. Wynn: Chronic Lung Disease.

Wednesday.—4 P.M. (in the Large Theatre of the Medical Faculty, Edmund-street), Sir Hubert Bond: Some Correlations between General and Psychological Medicine. (Third lecture.)

Friday (at the Queen's Hospital).—3.30 P.M., Mr. Douglas Marsh: The Significance of Hoarseness.

Appointments

Rycroft, B. W., M.D., Ch.B. St. And., has been appointed Honorary Ophthalmic Surgeon to East Ham Memorial Hospital.

Births, Marriages, and Deaths

BIRTHS.

Crowe.—On May 30th, at Beech House, Headingley, Leeds, the wife of W. Nigel Crowe, M.B., B.S., of a son.

Horsfall.—On May 30th, at Shempston, Cheam, the wife of Dr. T. M. M. Horsfall, of a son.

McFadyean.—On May 24th, at Herne Hill, the wife of Kenneth McFadyean, M.R.C.S., of a daughter.

McKendrick.—On May 27th, at Blackwood, Mon., the wife of William McKendrick, M.B., Ch.B., of a son.

Payne.—On May 21st, at Sussex Lodge, Colchester, the wife of Dr. W. F. Payne, of a son.

MARRIAGES.

Taylor-Jones—Corbett.—On May 27th, at St. Paul's, Herne Hill, Thomas Henry Edward Taylor-Jones, M.R.C.S., L.R.C.P., to Dorothy Amy Corbett, of Knowle.

Vernon—Wolfenden.—On May 30th, at St. Mary's Church, Netherbury, Dorset, James Anthony Vernon, M.R.C.S., L.R.C.P., to Eileen Mary, only daughter of the Rector of Netherbury and Mrs. Wolfenden.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

Central Association for Mental Welfare.—A course for officers of local authorities and local associations for mental welfare engaged in the ascertainment and supervision of defectives will be held in London from August 29th to Sept. 10th. It will be supplemented, where desired, by a week's practical experience under a trained worker in the provinces. Particulars may be had from the hon. secretary of the association at 21, Buckingham Palace-road, London, S.W. 1.

NOTES, COMMENTS, AND ABSTRACTS

THE NATIONAL COUNCIL FOR MENTAL HYGIENE.

THE second biennial conference of this council was held at the Central Hall, Westminster, from May 27th to 29th. The chair at the first session was taken by Miss **SUSAN LAWRENCE**, M.P., and the subject of discussion was

The Human Factor in International Problems.

Dr. J. R. **LORD** defined the human factor as the play of moral sentiments and higher emotional reactions, the exercise of habitual self-control and the possession of the cardinal virtues; that which made a man recognise his obligations to his fellow-men, and realise that reason and self-control were as necessary for his own sake as to avoid injury to others. The biological mission of mental hygiene was to curb or modify those factors in man's nature which were racial survivals of the time when he had not developed the higher social sense. War undoubtedly had an immoral, psychopathic origin, and one of the first functions of mental hygiene was to prevent war. He would suggest three slogans for the movement. The first was "to think internationally." Mental hygiene was international in that it was a necessity to all men, and, successfully planted in the home, it spread thence to dominate the psychology of multitudes. The reign of peace throughout the world depended on the cultivation of mental hygiene. A healthy national mentality did not look for war. To raise the level of activity and knowledge of mental hygiene throughout the world was the soundest way of establishing good feeling among the nations. The second slogan was "the necessity to disarm the mind." At critical moments of international understanding the reason and intellect must not fail. Happiness depended absolutely on the ability of people to feel normally, think rationally, and act properly. The discontent of the masses was an expression of the grave tension which existed between subjective needs and the outward possibility of satisfaction. The best outlet was culture, which ought not to lag painfully in the train of economics and industrialism, but should have the first place in the ordering of daily life. The aim should be to control not only nature, but human nature. Old conventions, customs, and values would need to be challenged; moral codes would need to be recast and positive elements supplemented; the emotions and their significance in behaviour would need to have an equal place in education with that devoted to the intellect. Mental hygiene had a great mission in eliminating emotionally driven handicaps to the exercise of conciliation, reason, and common sense. The third slogan was "fidelity to truth and duty." Mental hygiene must direct its efforts to dealing effectually with the emotionally unbalanced or criminally disposed section of the public, which was a source of danger to both national and international peace.

THE "INTERNATIONAL MILIEU."

Prof. A. **ZIMMERN** said that internationalism was inseparably connected in most people's mind with peace; the natural inference was that the international milieu was a sphere from which strife, conflict, and maladjustment had been banished and in which harmony prevailed. As a matter of fact, international relationships were for the great majority of people not normal but abnormal. Very rare were those who could lead a normal life, unconscious of malaise and maladjustment, in an international community. The very abnormality of the international milieu tended to deter the mentally healthy from associating with it, and the field was occupied by those who were not normal anywhere, and therefore felt more assurance, and passed muster more easily, in surroundings where nobody was quite himself. Thus the idyllic paradise of romantic sentiment, seen from the inside, revealed many of the characteristics of the sanatorium. There was no such thing as an international society or an internationl community. A national gathering was a real society; an international one was a mere collection of individuals who found themselves in the same room and contrived to pass the time without impinging on one another's angles. The expedients resorted to by resourceful hosts in such circumstances were generally based on appealing to the greatest common measure of the gathering. The greater the diversity, the more primitive would be the level at which the common measure would be found. Thus a gathering of all the nations might find itself submitted to an atmosphere recalling the forced geniality of a "pleasant Sunday afternoon." It followed that international public opinion was equally non-existent. The individuals who composed the international milieu continued in their new surroundings to maintain their habitual attitudes, and their natural instinct was to emphasise rather than diminish their national-mindedness. To hold one's own in the international milieu, to give a lead to opinion there, needed more than a small measure of the divine spark. An important consequence of the absence of international public opinion was a relaxation of social control. As an instalment of the millennium the League of Nations was bound to cause disillusionment. It was not an ideal, but a reality, and was the reverse of romantic. One of its greatest services was in bridging the gulf between romance and reality which had hitherto so greatly impeded the sober discussion of international problems.

THE NEED FOR AN INTERNATIONAL CULTURE.

Mrs. **NEVILLE ROLFE** pleaded for the reinterpretation of religions. International progress seemed to be based on a common recognition by different people of similar moral and social values based on sufficiently strong emotional and intellectual sanctions. This had applied in the Greek city states and the Roman Empire and to a lesser extent in the Holy Roman Empire, but, in the main, international agreements before the nineteenth century had been based on "the tie of common funk," and had shown very little cognisance of matters concerning the welfare of the general population. A survey of the subjects on which international agreement had been reached before the late war and of the records of the League of Nations showed that coöperation could first be obtained between divergent peoples on matters that concerned the fundamental principal human instincts, that social progress depended on a common sense of social values, and that social values were intimately bound up with the religious and ethical outlook of a people. The conventions on traffic in women and on slavery had been ratified by all those countries where individual liberty had a social value, but in a matter like obscene publications differing social values immediately raised a difficulty. In China it was indecent to kiss; the natural nudity of Africa could be obscene in Europe; the deratisation of a ship would involve a Hindu in grave sin on account of his abhorrence to taking life. For real international progress there must be an international culture. The current values accepted by the followers of the four main religions differed profoundly, but few people realised how continually and how considerably religious tenets had been and were being reinterpreted in the light of increasing scientific knowledge. To develop an international culture, therefore, the first step was a wider diffusion of modern science, particularly biological science.

At the next session the chair was taken by Sir **Hubert Bond**, and the subject was

The Human Factor in Crime.

Mr. C. C. **Roberts**, of the Howard League, said that crime had no single source, that there was no natural will to crime, and that every evil had a cause. Society was at last beginning to realise that the responsibility for its criminal classes rested on itself, that no criminal was impossible to treat, and that pure punishment was of little value. He suggested that prisons should be run on the assumption that each criminal was a case requiring individual treatment and different medicine to effect a cure. There should be a progressive form of imprisonment, giving him back more and more of his lost independence and leading him back to everyday life.

Dr. W. A. **Potts** said that the crime itself was often of little importance compared with the human factor. Sometimes the cause was a disorder of physical health, but it was more often a disorder of the mind. To put a mental defective on probation was no help to himself and might be dangerous to the community and put an unfair burden on the probation officer. The aim of the magistrate should be to find out what made the offender act as he did; not what could be done to him but what could be done for him. The cause could not be found out by an interrogation in court. Before inflicting punishment the authority must be certain that the case was a suitable one for punishment, that the offender understood why he was being punished, and that he had not already been punished enough before coming to court. To elucidate the human factor in crime, study must be made of the parents, the home, the school, the means of recreation, the life's work, and the offender himself and his reaction to these factors.

Mr. H. E. **Norman** (Secretary, National Association of Probation Officers) said that crime, although anti-social, was not necessarily anti-human; it was rather the effort of the individual to find expression for his human desires without proper regard for the interests of society. In attempts to control crime the community was apt to forget the potency of the human egoism which constituted its driving power. It was doubtful whether the stifling of the ego by an overbearing will of greater power could ever fall within the area of mental health. In the old days the only object of treating crime was to protect the community, but now, when society desired to ensure by every reasonable means that the delinquent should be converted to normal standards of behaviour, it was doubtful whether the retaliative penal system could ever be satisfactory. The first rational step was to study each individual offender's point of view, and this demanded patient and skilled investigation which should be conducted without close association with punitive treatment. Since the anti-social character of crime was closely associated with intense emotions, the simplest and most effective channel for reformation was through those same emotions where the hurt had first begun. Skilled exploitation of the human factor of the individual delinquent was irresistible, economical and practicable, but it called for very skilful training of the social worker, since the services of the medical psychologist were too expensive as a routine treatment. The probation system offered a framework for such an organisation and for the only practicable method of reformative treatment of crime.

At the next meeting the subject for discussion was "The Human Factor in Industry." The chair was taken by Sir Harry Goschen, and the speakers were Air-Vice-Marshal Sir David Munro, Mr C. J. Bond, Mr. W. H. M. Jackson, and Miss F. A. F. Livingstone.

Dean **Inge** took the chair at the discussion on

The Human Factor in the Social Services.

Dr. H. **Crichton-Miller** said that all human relations were conditioned by hereditary factors, and that without a eugenic ideal any programme of improvement was necessarily of limited scope. If a child had inherited a difficulty of adjustment it was important to make his process of education not more difficult but more easy. The excellent process of "hardening" must be adapted to the individual child's capacity of response and assimilation. One of the chief curses of civilisation was standardised education for the child of insufficient educability. The principals of schools would be well advised to examine not only the candidate but also the parents. In the modern mechanised community there was more need than ever before for the careful selection of the worker in relation to the work. There was ample and incessant evidence that Western civilisation was making a very limited success of monogamy. Marital discord, which had hitherto been concealed owing to pressure of religion, authority, and public opinion, was now being made manifest. The tremendous increase in the transmission of ideas meant that human personality was being devaluated in relation to social existence. Civilised man was becoming a creature of second-hand ideas, dictated opinions and preformed judgments. He had less freedom of thought than he had had for many generations. Modern education was not succeeding in neutralising the detrimental effects of civilisation. Thus there was a great call for better education in all human activities: vocation, marriage, and social relationships.

Dr. **Isabel Wilson** discussed the underlying motives of the social worker. He was often, she said, quite consciously motivated by the desire to save others what he himself had suffered. Others might be quite unconscious of this identification. The value of work based on identification was its single-hearted earnestness, and the danger was its narrowness and disregard of other claims. A certain type of worker went on unsparingly and unceasingly because he was afraid to stop; a long, idle holiday was the cure. The sense of inadequacy or of guilt might link the worker's mental conflict with his work. A certain type of social work was done in order to give a comfortable feeling of usefulness or charitableness to one aware of being otherwise purposeless or uncharitable. The work might be good, but so long as it soothed a man's conscience he was unlikely to deal faithfully with the rest of his life. Another personal tendency was that of seeking self-glorification through work. These motives should always be taken into account, in order that the worker might make the best of himself, and the organiser might realise the great stores of energy available in deep-lying motives. The slow progress of international social service depended on certain personal factors: the limitation of human experience and of human intelligence and the stability of racial type.

Miss **Camilla Wedgewood** urged the value of traditions in guiding social progress, provided that they were not allowed to act as an insurmountable barrier in the path of social evolution. They were a check on violent changes, and a unifying factor. Traditions differed from history in being idyllic conceptions of the past and giving a sense of dignity to a people. They were thus a powerful factor in preserving social cohesion and building up and fortifying the conscience and self-respect of the individual.

The final session, under the chairmanship of Sir **Percy Nunn**, was devoted to a discussion of

The Human Factor in Education.

Prof. J. E. **Marcault** said that the new individuality made itself felt at every step, especially in the claim of the new generation for its right to personal experience. Education strove nowadays, not so much to hand on the common culture of the social group to all children, as to bring to its realisation of expressive creativeness that which was individual and unique in the child. The all-important factor in education was the dynamic flow, and the measure of concentration of diffusion of the conscious dynamism was the measure of the individual itself. Psychology discovered the individual; education had to educate it by applying the new psychological ideas. There was no need to be afraid of individualism. The education of the concentrated self could not be unsocial, for that self had been at all times the creator of all social relations and values, and was the creator of still more universal relations and values in the present. In educating the individual child we educated that which was universal.

Sir BENJAMIN GOTT said that the human factors in a child's education should teach the child: (1) that he must live and earn his living; (2) how to get the best out of life and use leisure to the best advantage; (3) how to maintain a healthy body; and (4) the responsibility of democratic government. Teachers and parents should see more of each other, and boys and girls should be taught together. The teachers should be carefully selected and should then be allowed plenty of freedom to deal with the child's special abilities and predilections.

Dr. F. C. SHRUBSALL said that much depended on the human factor in education. The seeds of many ills were sown by human agencies in the first years. The human element began with the child itself, whose inborn mental and physical traits were the fundamental datum line. A knowledge of the possibilities of the inherited pattern would be helpful to the teacher as well as to the psychotherapist. The child learned by suggestion, and was more affected by the feelings of those around him—as expressed in their actions and attitudes—than by their words. While uniform treatment, whether good or bad, could produce good results, changeability undermined the character before it was formed. The best form of punishment was to allow the child to suffer the inevitable and suitable consequences of its fault. The child learned most from contact with fellows of about his own age, and the only child among grown-ups therefore suffered great disadvantages.

AN IMPOSTOR.

LETTERS of a begging character are being sent out from an address in Dublin to prominent persons, claiming assistance on the ground of the writer being a doctor and suffering from a war injury, both of which statements are false.

Vacancies

For further information refer to the advertisement columns.

Aberdeen Royal Hospital for Sick Children.—Hon. Medical Officer.

Accrington Victoria Hospital.—Hon. Anæsthetist. Also H.S. £150.

Albert Dock Hospital, Connaught-road, E.—Res. M.O. At rate of £110.

All Saints' Hospital, 91, Finchley-road, N.W.—H.S. At rate of £150.

Barnsley, Beckett Hospital and Dispensary.—Res. Surg. O. £300.

Birmingham Ear and Throat Hospital, Edmund-street.—H.S. At rate of £150.

Birmingham and Midland Eye Hospital.—Res. Surg. O. £150.

Blackburn, Royal Infirmary.—4th H.S. £150.

Bolingbroke Hospital, Wandsworth Common, S.W.—Hon. Physician for Diseases of Children.

Bootle General Hospital.—H.P. At rate of £150.

Brighton, Hove and Preston Dispensary.—Dist. M.O. Also Hon. Phys. for Ditchling Road Dispensary.

Brighton, Royal Sussex County Hospital.—Cas. H.S. £120.

Bury St. Edmunds, West Suffolk Hospital.—Locum Asst. for Path. Laby.

Cancer Hospital, Fulham-road, S.W.—H.S. At rate of £100.

Canterbury, Kent and Canterbury Hospital.—H.P. and H.S. Each at rate of £125.

Chesterfield and North Derbyshire Royal Hospital.—Cas. O. At rate of £200.

Connaught Hospital, Walthamstow, E.—Res. H.P. At rate of £100.

Derby, Derbyshire Hospital for Sick Children.—Res. H.S. and Res. H.P. At rate of £150 and £130 respectively.

Derby, Derbyshire Royal Infirmary.—Ophth. H.S. Also Cas. O. Each at rate of £150.

Doncaster Royal Infirmary.—H.S. At rate of £175.

Dorset C.C. Education Committee.—School Dentist. £450.

Dreadnought Hospital, Greenwich.—H.P. and H.S. Each at rate of £110.

Durham, County Council.—District Tuber. M.O. £500.

Durham County Council and Chester-le-Street U.D.C.—District Tuber. M.O. and M.O.H. £800.

Essex Administrative County.—Asst. County M.O.H. £500–£600.

Exeter, Royal Devon and Exeter Hospital.—Res. Sen. H.S. £250. Also Res. H.S. and H.S. to Spec. Depts. Each at rate of £150.

Gloucester, Gloucestershire Royal Infirmary, &c.—H.S. At rate of £120.

Hampstead General and N.W. London Hospital, Haverstock-hill, N.W.—H.S. and H.P. Each at rate of £100.

Hospital for Sick Children, Great Ormond-street, W.C.—Part-time Jun. Cas. O. At rate of £150.

Hospital for Tropical Diseases, Endsleigh-gardens, W.C.—H.P. At rate of £150.

Hove Hospital, Sackville-road.—Res. M.O. £150.

Hull Royal Infirmary.—3rd H.S. At rate of £150.

Ilford Borough.—Asst. M.O.H. £600.

Indian Medical Service.—Commissions.

Inverness, Royal Northern Infirmary.—H.P. At rate of £100.

Ipswich, East Suffolk and Ipswich Hospital.—Cas. O. £120.

King's Lynn, West Norfolk and King's Lynn Hospital.—Jun. H.S. At rate of £125.

Lancaster Royal Infirmary.—Jun. H.S. £130.

Leeds, Gateforth Sanatorium.—Res. M.O. £450.

Leeds, Herzl Moser Hospital, Leopold-street.—R.M.O. £100.

Leeds Hospital for Women.—H.S. At rate of £50.

Leeds, St. James's Hospital.—H.P. and S. At rate of £200.

Liverpool Psychotherapeutic Clinic, 56, Bedford-street North.—Part-time Med. Reg. £150.

London, Female Lock Hospital, 283, Harrow-road, W.—H.S. at rate of £150.

London University.—Examinerships.

Manchester Babies' Hospital, Burnage-lane, Levenshulme.—Sen. and Jun. Res. M.O.'s. At rate of £125 and £50 respectively.

Manchester Ear Hospital, Grosvenor-sq., All Saints.—H.S. £150.

Manchester, Royal Children's Hospital.—Sen. M.O. for Out-patients' Dept. £300.

Maudsley Hospital, Denmark Hill, S.E.—Sen. Asst. M.O. £650.

Middlesex C.C., Redhill Hospital, Edgware, and Park Royal Hospital, Willesden.—2 Res. Asst. M.O.'s. Each £400.

Miller General Hospital, Greenwich, S.E.—H.P. and H.S. Each at rate of £125. Also Out-patient Officer. At rate of £150.

National Hospital for Diseases of the Nervous System, Queen-square, W.C.—Hon. Asst. Radiologist.

Newcastle-on-Tyne, Royal Victoria Infirmary.—Two Jun. Surg. Regs. Each £150.

Newport, Mon., Royal Gwent Hospital.—Jun. Res. M.O. £135.

Nottingham City Infirmary.—4th Res. M.O. £350.

Nottingham General Hospital.—Cas. O. At rate of £200.

Oldham Royal Infirmary.—H.P. and Cas. O. Each at rate of £175.

Oswestry, Shropshire Orthopædic Hospital and Agnes Hunt Surgical Home.—H.S. At rate of £200.

Plymouth, South Devon and East Cornwall Hospital.—Asst. Pathologist. £650.

Poole, Dorset, Cornelia and East Dorset Hospital.—Hon. Orthopædic Surg.

Princess Louise Kensington Hospital for Children, St. Quintin-avenue, North Kensington, W.—H.S. At rate of £100.

Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Res. Anæsthetist. At rate of £100.

Queen's Hospital for Children, Hackney-road, E.—Res. M.O. At rate of £200.

Rhondda U.D.C.—Temporary Asst. M.O., &c. £500.

Rotherham Hospital.—Cas. H.S. £150. Also Sen. H.S. £200.

Royal Free Hospital, Eastman Dental Clinic, Gray's Inn-road, W.C.—Res. H.S.

Royal National Orthopædic Hospital, 234, Gt. Portland-street, W.—Asst. Reg. Surg. for Country Branch, Stanmore. £350.

Royal Northern Hospital, Holloway, N.—H.S. At rate of £70.

St. Mary's Hospital, Institute of Pathology and Research, Paddington, W.—Research Studentship. At rate of £200.

St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.—Clin. Assts.

Salford Royal Hospital.—H.P. and H.S. Each at rate of £125.

Scunthorpe and District War Memorial Hospital.—2nd Res. Surg. £150.

Sheffield Children's Hospital.—H.P. and Third Res. M.O. At rate of £100 and £80 respectively.

Sheffield, Jessop Hospital for Women.—Three Asst. H.S.'s. Each at rate of £100.

Sheffield Royal Infirmary.—H.S., Ophth. H.S., Asst. Aural and Ophth. H.S. Each at rate of £80.

Southampton County Borough.—M.O.H. &c. £1250.

Southampton, Royal South Hants and Southampton Hospital.—Res. H.P. and 2 H.S.'s. All at rate of £180.

Stockport Infirmary.—H.S. £175.

Stoke-on-Trent, Longton Hospital.—H.S. £120.

Swansea General and Eye Hospital.—H.P. £150.

Surrey County Council.—Asst. M.O. £600.

Warwick County Mental Hospital, Hatton.—2nd Asst. M.O. £450.

Western Ophthalmic Hospital, Marylebone-road, N.W.—Jun. Non-Res. H.S. At rate of £100.

West London Hospital, Hammersmith-road, W.—H.P. and two H.S.'s. All at rate of £100.

Willesden General Hospital, N.W.—Hon. Clin. Asst. to Surgical Out-patient Dept.

Windermere, Ethel Hedley Orthopædic Hospital for Crippled Children.—Res. H.S. £150.

Woking and District, Victoria Hospital.—Res. M.O. At rate of £100.

Woolwich and District War Memorial Hospital, Shooters Hill, S.E.—H.P. At rate of £100.

York, The Retreat.—Sen. Asst. M.O. £400–£500.

LONDON CLINICAL SOCIETY.—The sixth annual Macalister lecture of this society will be delivered at the London Temperance Hospital on Tuesday, June 16th, at 9 P.M., by Major Richard Rigg, whose subject will be Medicine and the City Guilds. All medical practitioners are invited and may bring friends.

ADDRESSES AND ORIGINAL ARTICLES

THE PLACE OF MEDICAL SOCIETIES IN THE PROGRESS OF MEDICINE.*

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WE are gathered here to celebrate the centenary of the Harveian Society of London, and we are honoured by the presence of representatives of the sister society of Edinburgh, founded in 1782, and of that of New York, founded in 1905. The occasion may be not inopportune for considering some features of the life-history of medical societies in Great Britain.

Three Harveian Societies.

Human activity, in so far as it is enduringly fertile, is not the chance product of a few creative minds, but is conditioned by its antecedents and environment and tends to express the dominant tendencies of the time. Thus the Harveian Society of Edinburgh was born of a demand that found expression in various ways in the last quarter of the eighteenth century for the democratisation of medical knowledge. Phœnix-like it arose out of the ashes of an older Æsculapian Society, membership of which had been exclusive and limited to Fellows of the Royal Colleges of Physicians and Surgeons. The Harveian Society opened wide its doors not only to such Fellows, but also to medical graduates, neighbouring practitioners, and the naval and military medical services as well. The Scotch genius for conviviality seems to have asserted itself in the constitution of this society, as it kept in the forefront of its programme the cherishing of friendliness among members of the profession, and the degrees conferred by it included "Doctor of Mirth and Social Joy" and "Doctor of Merriment." So this society was true to Harvey's injunction as to the importance of cherishing actively the spirit of good fellowship as an assurance of usefulness and stability.

The Harveian Society of London was launched on its career of enduring prosperity at a time when educational reform was alive and active in every branch of intellectual activity. In London in little more than a decade University College, King's College, and the University of London came into being. Medical societies had already spread from their first metropolitan homes in Edinburgh and London to the provinces, and in 1819 a further tendency to decentralisation within the growing metropolis had declared itself in the foundation of the Hunterian Society, for the benefit of the medical profession in the East End of London. The purpose of this Harveian Society at its birth was to do the same for the West of London, for it should be remembered that in 1831 the centre of medical activity was not as now in Harley-street, but in the district adjacent to the British Museum.

One important function of medical societies has been to provide a medium for the conveyance of fresh knowledge from the centre to the periphery of the profession. Scientific discoveries tend to be minted in minds concentrated at the centre, but it is by the minds of the multitude of practitioners scattered throughout the country that the golden coins gain extensive currency. The flow of fresh knowledge has thus been mainly centrifugal, and very little in the reverse direction, for the country practitioner is more directly concerned with the art of medicine, which is individual and incommunicable, while the science of medicine is catholic and susceptible of ready transmission. A notable exception, however, to the general rule was Jenner's work on vaccination, a piece of scientific work that was readily practicable only in the milieu of a rural practice; while later still from the genius of Manson, Ross, and others, we at home have learnt that the highest scientific achievements may be compassed in the outposts of our far-flung empire. At its foundation this society declared its purpose to be "to promote a free communication and, whenever practicable, a demonstration of facts and inferences relating to all departments of medicine, regarded both as a science and an art." Here then was a common meeting ground for the exponents of both the art and the science of medicine and this throughout its hundred years of existence has been its peculiar cachet.

The Harveian Society of New York was founded in 1905: its avowed purpose was to convey to the medical profession generally, by means of lectures delivered by experts in different branches of medical science, knowledge gained by experimental investigation in the laboratory. It was felt that such knowledge was liable to be buried in specialised publications that were not readily accessible to the general practitioner. Anyone who is familiar with the annual volumes in which these lectures are published cannot fail to recognise the great measure of success that has attended this high endeavour. This society then is the natural corollary of the rapid growth of experimental research that has been an outstanding feature of twentieth century medicine.

Functions of a Society.

This brief outline of the activities of these three Harveian societies affords some indication of the various ways in which medical societies have aided in the diffusion of knowledge by the agency of discussions, papers, lectures, exhibition of patients and specimens, demonstrations and the printing of proceedings, but it does not cover the whole ground, for some societies have enlarged the scope of their transactions, so as to include reviews of books and abstracts of articles of scientific value, the usefulness of which to medical men can hardly be overrated, while others have added the manifold amenities of a well-organised library.

The *diffusion* of knowledge has been the primary, but by no means the exclusive purpose of medical societies, for the methods adopted for the active diffusion of knowledge cannot fail to have some share both in the *acquisition* of existing knowledge and in the *creation* of new knowledge; the larger and more affluent medical societies have indeed lent themselves to the acquisition of knowledge only in a less degree to its diffusion. In the acquisition of knowledge books and periodicals necessarily play an important part, and to this end not a few societies have provided their members with libraries, the most highly systematised of which have already attained a very high degree of utility and excellence.

The creation of new knowledge can in the nature of things form only a very limited part of the activities of a medical society as such. It is true that the intercourse of fertile minds does give birth to new conceptions and these in turn engender others, and this constitutes a creative act, but the experimenter, who would commune with nature, must needs enter his chamber and be still, and his chamber is the laboratory not the meeting house. So, too, fruitful observation postulates the presence of the objects to be observed in a suitable milieu, and in the case of morbid material, living or dead, that milieu is the hospital or its clinical equivalent.

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* Address at the Centenary Celebration of the Harveian Society of London at St. Bartholomew's Hospital on June 11th, 1931.

If we trace back the development of medical societies to its source, we find that the earliest were concerned at least as much with the acquisition and creation as with the diffusion of medical knowledge; the more restricted function has been gradually evolved. Both Bacon and Harvey have left us a picture of the constitution and scope of the society, to which they would have entrusted the future of medical science. Each of these men was a typical product of the spirit of an age that had its roots in the Reformation; each was a champion of the scientific scepticism that, with the emancipation of the human mind from the tyranny of authority and dogma, sought by means of observation and experiment to find a rational basis for the interpretation of physical phenomena.

Bacon's Plan.

Bacon believed that science might be immensely advanced if the whole civilised world could be linked up into one scientific federation for the creation and dissemination of knowledge, and his allegorical picture of Salomon's house in the ideal commonwealth of Bensalem represents the organisation by which he would make his idea effective. His college was to consist of 36 Fellows, half of whom were to be engaged in the acquisition and recording of all existing knowledge of discoveries and inventions from every conceivable source in all parts of the world; the other half, in six groups of three each, was to be engaged in the devising, directing, executing, and recording of new experiments. Such was to be the guiding personnel of his visionary college, of which the equipment was to be on the most lavish scale. If to-day some master-mind were to fashion a scheme by which all scientific societies, covering every branch of science, should be amalgamated into one colossal institute, if he were to give each professor a free hand to construct, equip, and staff his department on the most lavish scale the professorial mind could conceive, with the addition of an unlimited secretariat and foreign correspondency, the whole directed by an all-wise and all-embracing Research Council, we should still have but a pale exemplar of Bacon's House of Salomon.

It might appear that Salomon's House has but a slender claim to figure in the lineage of the medical society of to-day, but such is not the case, for there is indisputable evidence that it had a direct and important influence in promoting the foundation of the Royal Society, and further evidence that the earliest purely medical societies did consciously adopt as their model certain features that had been tried and approved in the constitution and procedure of the Royal Society. Bacon did not even differentiate medical science from the general corpus of natural philosophy, nevertheless he did include it, and made abundant provision for the acquisition and creation of new knowledge, while leaving the discoveries to be their own advertisement. Though Bacon and not Harvey is thus the true progenitor of our Royal Society, that great corporation has flourished not in the leading-strings of Bacon but by the free and independent pursuit of the method and practice of Harvey. That its birth was delayed until Bacon had been dead 36 years and Harvey was in his grave, was again an accident of the times brought about by the disintegrating influence of years of civil commotion.

Other influences than Bacon's large-scale plan contributed to the foundation of the Royal Society. Evelyn was one of its founders, and his letter to Boyle in 1659 indicating his willingness to endow at his own expense a College the members of which "would resign themselves to live profitably and sweetly together after the manner of the Carthusian Convent in Paris", shows that the example of the monasteries survived their demolition; his College was to do for science what the monasteries had done for religion.

Harvey's Contribution.

Due recognition has not been accorded to Harvey's place in the life-history of the medical society, though it is plain for all to see in the indenture, by which he conveyed to the College of Physicians his patrimonial estate of Burmarsh. Harvey was not the man to weave from his imagination the insubstantial fabric of a dream, as Bacon had done; he sought to build on foundations that lay ready to receive his superstructure in his beloved College of Physicians; in his mind, as in Bacon's, the organisation of the medical society had not emerged from the collegiate stage. In this indenture, after providing for an annual feast within the College, he ends with an exhortation "to search and study out the secrets of Nature by way of experiment; and also for the honour of the profession to continue in mutual love and affection among themselves, ever remembering that *Concordiâ res parvæ crescunt, discordiâ magnæ dilabuntur*." In these words Harvey lays down the very lines on which medical societies have subsequently developed, their educational purpose being supplemented by a bond of good fellowship and conviviality. Harvey had only too good reason to appreciate the value of mutual friendliness to the advancement of medical knowledge. The acerbity and antagonism with which many of his professional brethren had greeted his proof of the circulation of the blood had sered the inmost recesses of his soul, and he is recorded as saying that the stoniest soil of all was in the minds of men over 40 years of age. He too had reason to stress the importance of the social bond. All his life he had been a solitary worker, tireless, as John Hunter after him, in the practical study of comparative anatomy. Only once do we catch a glimpse of him in active collaboration with a fellow-worker, comparing notes of his embryological studies with George Bathurst of Trinity College, Oxford, who kept a sitting hen in his rooms to incubate eggs which he examined day by day to observe the stages of development of the embryonic chick. That Nathaniel Highmore was also independently at work at the same inquiry in the same College need not lead us to assume that the College eggs were peculiar in suggesting compellingly the study of embryology, but rather, as John Hunter has naively said of the development of birds in eggs, "It would almost appear that this mode of propagation was intended for investigation."

One more feature of many medical societies is forestalled in Harvey's will, devising a sum of money for a librarian and for the upkeep of the library he had already presented to the College, so that medical men might have ready access to the contributions that others had already made to the sum of medical knowledge; and for the diffusion of knowledge were there not in existence endowed lectures, in which he himself had already achieved immortality by first setting forth in his Lumleian lectures his proofs of the circulation of the blood? Viewed then as a whole there is little in the constitution of the medical societies of to-day on which Harvey has not long since pronounced substantial benediction. Perhaps then our three societies have done well to adopt his patronymic, for the circulation of medical knowledge is as vital to the higher professional life as is the circulation of the blood to higher animal life.

The contrast of Bacon and Harvey is well expressed in some lines of Browning in the Grammarian's Funeral:—

> The low man seeks a little thing to do
> Sees it and does it;
> This high man, with a great thing to pursue,
> Dies ere he knows it.
> That low man goes on adding one to one,
> His hundred's soon hit:
> This high man aiming at a million
> Misses an unit.

The Royal Society.

Time does not permit me to retell the familiar story of the growth of the Royal Society out of the union of those two groups of gifted amateurs known as the Invisible College of Boyle and the Philosophical Society of Oxford, nor to insist on their indebtedness to the pioneer effort of Sir Thomas Gresham in the foundation of his College in 1575. The transition from a group to a society is something more than the passage from a coterie without a name to a coterie with a name; it is the first step towards the transference of an exclusive possession of the few to the participation of the many. The history of British medicine is punctuated with informal groupings of fellow workers, such as those of William Gilbert, Glisson, and Erasmus Darwin, for the tendency to cohere is an instinct of the human herd; such groupings become a society in name, when they adopt a formal constitution, but they do not become a society in spirit until the evangelist spirit animates and inspires them to propagate knowledge beyond the narrow confines of their own community or to enlarge the confines by an extension of membership. This evangelist spirit was dominant in the early years of the Royal Society, side by side with its primary purpose of stimulating the creation of new discoveries. At first the work of the meetings consisted mainly in the exhibition of experiments by members and the reproduction of experiments already made by other scientific workers, together with the reading of papers. Besides discussion of experiments shown, a feature was the devising of fresh experiments to be carried out elsewhere. Great pains were bestowed on keeping in touch with work in other countries by an organised system of correspondence with foreign scientific workers, whose letters were duly communicated to the society. Abstracts of important articles in foreign journals were made and read, so that the purview of the society was international. Further, the society took care by the publication of Transactions to communicate its own work to other countries, as the French *Journal des Savans* had begun to do for Colbert's scientific coterie three months previously; and in taking upon itself the publication of treatises the society was willing to assume the paternity of Newton's *Principia*. Medicine, or rather the embryo sciences out of which medical science was to arise, received generous treatment at the hands of the society, for two of its eight constituent committees, the anatomical and the chemical, were entirely in the hands of physicians who enjoyed there facilities not to be found in the College of Physicians.

So the Royal Society led the way in Great Britain in promoting the mutual exchange of views among its members by means of discussion and in the publication of transactions, which, both in what they received and what they gave, looked beyond the narrow confines of their own country, and both these features have figures in many of their descendant medical societies.

The First Purely Medical Societies.

So far as corporate action for the progress of medicine went, until 1731 the Royal Society and the Royal College of Physicians held the field. In that year there came into existence in Edinburgh the first exclusively medical society in the modern sense. The preface to the first volume of its Transactions leaves no doubt as to the reasons for its foundation, for these are explicitly stated to have been that the constitution of the Royal Society did not allow it to insert in its Transactions several things that a plan calculated for the improvement of physic would easily admit, and further, the belief is expressed that a collection of observations wholly relative to medicine would be the most effectual way to improve physic. It was not that medicine had proved to be a bad stable companion, but only that she could go better in single harness. The change was momentous, for it involved not only the segregation of medicine from the general body of science, but the handing over of its future to those who were not primarily concerned with scientific research, and the consequence of this was inevitable, that the diffusion of knowledge and not its creation became the prime purpose of medical societies. That Scotland should have led the way in the development of the modern medical society is due to the fact that Scotland was the first, inspired by the example of the Dutch, to organise in 1725 a medical school of practical clinical teaching, and the founders of this society were those teachers of the school who desired that their voices should be heard beyond the four walls of the Edinburgh school of medicine. The sole purpose of this society was the publication of medical papers, and there was no provision for reading or discussing them before the society.

In 1752 London followed suit in constituting its first medical society, and here again we must admit direct Scotch influence, for Fothergill, its founder, though a Yorkshireman, had received his academic training in medicine in Edinburgh, and had been a member of its second medical society. The London society limited itself to the publication of papers, and like its Scotch prototype rested on a narrow basis of membership of a few hospital physicians and surgeons. Each society was short-lived in its original form, for the Scotch society, by reversing the process of evolution, became first the Philosophical Society of Edinburgh by the inclusion of philosophy and literature, and later, in 1783, the Royal Society of Edinburgh. In this very same year the English society died a natural death, that not even the quickening influence of an annual banquet could stave off, for it had not been granted the faculty of making the dry bones of medicine live, without the vivifying guidance of Fothergill and William Hunter, who had been its mainstays. Maybe too that their proclaimed purpose of excluding "whatever has rather a tendency to display the parts and erudition of the writer than to advance medical knowledge," led to a dearth of papers. This society, by its example, stimulated a group of Fellows of the College of Physicians, in 1767, under the leadership of Heberden to meet and read papers, which they issued in the form of "Medical Transactions"; but this effort to project the College along the lines laid down for it by Harvey flickered out with the publication of the last volume in 1820. One admirable suggestion in the preface to the first volume may still be practised with advantage: "It is to be wished," says the author, "that writers would not confine themselves to relate only their successful practice. A physician of great experience might write a very useful paper if he would have the courage to give an account of such methods of cure only as he had found to be ineffectual or hurtful." This hushing-up of mistakes and failures unhappily extends beyond writers and is an almost universal feature of hospital teaching to the very great impediment of the growth of clinical knowledge.

In tracing the expansion of the functions of medical societies, we must again look north to Edinburgh, where in 1734 a few students had banded themselves together for mutual assistance in their studies; Fothergill joined them in 1735. By 1737 they had formally organised themselves into a society, which growing from strength to strength built itself a hall, and in 1778 became the Royal Medical Society of Edinburgh. This society marked a definite advance on its predecessor, for it had formal meetings at which papers were read and discussed, but it maintained at first the tradition of exclusive membership. Being at the outset a students' medical society it gives Scotland the claim to have anticipated by many years the formation of the first students' society in London, the Physical Society of Guy's, that was not born till 1771.

Rise of Societies in London and Provinces.

For the first far-reaching democratisation of medical societies we must look to the foundation of the Medical Society of London by Lettsom in 1773. To Lettsom is due the credit of giving actuality to an idea, but beyond all question the society was the natural product of the professional circumstances of the time. Both Fothergill and Lettsom were Licentiates of the Royal College of Physicians, and each had winced under the stigma of exclusion from the Fellowship, which was the virtual monopoly of Oxford and Cambridge graduates, who were members of the Church of England. Fothergill had taken an active part in the struggle that was fought out between the College and its Licentiates, not only in the law courts, but with a show of violence on the floor of the College itself. Now Lettsom sought to sap the very foundations of the citadel of exclusiveness by setting up beside it a rival institution, as like as he could make it in constitution, and as little like in its spirit of professional exclusiveness. One cannot fail to see in its president, treasurer, registrar, librarian, council, library and museum; in the language and ceremonial mode of admission of Fellows; in the annual oration and much else where Lettsom looked for his model. From the first this society possessed a meeting-house furnished with a library, which Lettsom enriched greatly at his death. But there the resemblance ended, for Lettsom saw to it from the first that his society was broad-based on the enfranchisement of general practitioners on the same footing as physicians and surgeons. Lettsom's foundation seems to have served his purpose, for in 1782 a scheme was mooted for the foundation of a rival College of Physicians, to which the Royal College responded two years later by relaxing so far as to admit two rebel licentiates to its Fellowship.

With this democratic society in the field, it may be a matter of surprise that the Medical and Chirurgical Society should have come into existence in 1805. It is commonly alleged that this society was founded in dissatisfaction with the protracted presidency of one James Sims over the Medical Society. I find it hard to believe that our robust ancestors of 130 years ago were unequal to the task of unseating a senile president, and I find a far more satisfying explanation in the professional circumstances of the time. The fact was that a young cuckoo had been hatched and had already become too large for the parent nest, and that young cuckoo was modern scientific surgery, brought to birth by John Hunter. The very change of name from Medical to Medical and Chirurgical tells its own tale, and the chief figure of the surgery of the day, Sir Astley Cooper, figures prominently among the seceders. A ripple had already appeared on the surface of the water, in 1783, when John Hunter had established "A Society for the Improvement of Medical and Chirurgical Knowledge," the membership of which never exceeded 12. So exclusive a body was bound to go under in competition with its new democratic rival, and it died of inanition in 1818. Nor must we forget that the Royal College of Surgeons had come into being five years previously, in 1800.

So, if the birth of the first medical society in 1731 marks the severance of medicine from natural philosophy, and the birth of the Medical Society in 1773 marks the full democratisation of medical societies, we may recognise in the birth of the Medico-Chirurgical Society in 1805 the emancipation of surgery from the mortmain of medicine.

Meantime another notable advance had been taking place in the spread of societies from their metropolitan homes to the provinces. Warrington had a medical society as early as 1770, but no provincial society of that century was so famous as the Gloucestershire Society founded by Edward Jenner in 1788. The minute books of the Gloucestershire Society, in the handwriting of Jenner, are a treasured possession of the Royal College of Physicians, bequeathed to them by Sir William Osler, than whom no one in the whole history of medical societies did more to cement the social bond, by the charm of his personality, the catholicity of his friendship, and the inspiration of his enthusiasm as a crusader. In these manuscript pages you may find a living picture of a rural medical society of the day, but time forbids me to do more than reveal one gem from this treasure house. Rule XIII. reads: "That as a principal part of the view of the Society is the mutual communication of knowledge, without fear, reserve, or any other authority than that of Truth, no new member shall be admitted for these seven years to come whose age exceeds 40 years."

Specialist Groups.

I could have wished for time in which to unravel the tangled skein of fission and fusion, by which the Medico-Chirurgical Society has become transformed into the Royal Society of Medicine, for therein lies a typical record of the evolution of medical societies in the nineteenth century, but I must needs restrict myself to a few outstanding features. The first quarter of the century, indeed almost the first half, was a period of static equilibrium, for surgery had now come into its own and was intent more on its own internal development than on its external relations; the process of decentralisation within the metropolis, which gave birth to the Harveian Society of London, showed however that animation was only in suspense. In the second half of the century we find the growth of medicine and surgery asserting itself in an orgy of fission, out of which arose a succession of specialised societies, each engaged in the pursuit of its own limited ideal; the Medico-Psychological Association seems to have struck the first note in England in 1841. But though fission was the dominant note, fusion never passed entirely out of sight. Time and again we find overtures for reunion of the Medical with the Royal Medico-Chirurgical Society, and efforts of young seceders to re-establish relations with the parent body; it remained, however, for the twentieth century to reconcile these antagonistic tendencies by a comprehensive scheme of federation. Of these specialist secessions two are of special interest. In 1846 the Pathological Society gave expression by its foundation to the feeling that existing societies paid inadequate attention to pathological subjects. It was indeed the case that until its foundation, in a period when the intensive study of morbid anatomy had become a central feature of medicine, provision for the exhibition of morbid specimens existed only in name; and in 1850, when the Pathological Society was seeking shelter beneath the roof it had recently deserted, the reply of the Council of the parent society was that the exhibition of many recent specimens would probably create a nuisance.

So again in 1867 the Clinical Society came into being as a result of the belief that the parent society cultivated too little the practical aspects of medicine and surgery but expected its members to extract nutriment from a dry diet of papers. Yet this young society for a decade of years was content to talk about cases instead of exhibiting them, and it was not till 1879 that it formulated regulations for the exhibition of living cases, and these seem to have borne no fruit until 1882. A lesson might have been learnt from the Medical Society, which was showing cases at its meetings as early as 1861.

Communications and Companionship.

In the contribution of medical societies to the advancement of medical knowledge we must look for no harvest of great discoveries; their function is rather to afford a meeting-place for the mutual exchange of everyday ideas. They do afford the opportunity to advance or to receive new ideas, to submit them to criticism and correction, and to purge thereby the dross from the ore, and in this intercourse of fertile minds new conceptions will certainly be engendered. They do provide facilities for intercommunication to every type of practitioner, and one lesson of Jenner's life seems to be that even in the isolation of a country practice, amid the hourly demands of a toilsome calling, it is possible with the aid of societies and interchange of ideas with those more fortunately situated, as John Hunter was, to keep the mind alive to every new source of information and even to carry out original investigations in many branches of medicine, biology, and natural history. The modern development of libraries, too, has brought wide facilities at a trifling cost to every practitioner's door, and along with the medical journals has rendered easy communion with the great minds of the present as well as of the past, both in this country and beyond the sea. Societies, too, have been important agents in promoting among medical men that feeling of good fellowship that is essential for fruitful coöperation; men's minds are massaged by rubbing against each other, and they rub off their angles by mutual attrition. In this conviviality has played its part, however humiliating it may be to reflect that the tiger in man needs ever to be appeased by the prospect or retrospect of a meal. La Rochefoucauld has said that nothing is so bad as we imagine it to be, and he might well have added "nobody." Few of us but are aware of some personal prejudice, founded on no better grounds than gossip or misunderstanding, melting like snow in the warmth of personal intercourse.

Anyone who studies the domestic history of medical societies cannot fail to be struck with one circumstance. Time and again a new need has arisen, but the dead hand of inertia has prevailed, and no step is taken to meet the new need; then fission takes place, and a fresh society emerges—often out of the very vitals of the parent society and to its detriment. Why is it that societies tend to lose responsiveness to their environment? Is it that their official administration has in the past been far too much in the hands of the older members? Were Harvey and Jenner and Osler right in believing that 40 years is apt to be quite as critical an age in the lives of men, as it is alleged to be in women's valuation of their own lives? If so, would it not be well that every society should have a regulation that at least one-half of its governing body should be under 40 years of age? That is a question to which I leave each one of you to make his own answer.

MATERNAL DISABLEMENT.*

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LECTURE II.

It was shown in the preceding lecture that there is a vast amount of maternal disablement following pregnancy, parturition and the puerperium, directly or indirectly caused; and that whereas the maternal death-rate is about 0·5 per cent. of all live-birth deliveries† the disablement rate would seem to be no less than 10 per cent. of all pregnancies. Such a state of affairs alone calls for serious national consideration. It seems almost incredible that every year one woman in every ten of those who bear children is to be more or less disabled or has to endure an operation to cure her injuries. Yet, in the absence of exact figures this seems a conservative estimate. Besides, probably many more bear in silence minor lesions which may prove fatal later. It is not unreasonable to hope that with an organised maternity service, exact statistics will be forthcoming a few years hence.

To every student of the subject of maternity in these islands it must be clear that while the mortality should be reduced, and can be reduced, possibly by about one-quarter or one-third, there are few, I think, who knowing all the circumstances would be prepared to go so far as the Minister of Health[1] did when he stated that "not less than one-half—it might be more—of these maternal deaths were preventible." Until the state of affairs which I envisage has existed for two generations such an improvement is but an armchair dream. There must be a large irreducible minimum so long as the present high percentage of pre-adolescent crippling obtains among girls. Still, it may be possible by organised effort to save one life, now lost, in every 1000 labours—a saving to the country of about 1000 women a year. But it follows, too, from what has been said that women in danger who are saved are generally women seriously injured; consequently, putting aside the question of producing sound mothers, a properly organised scheme should include the prevention and treatment of obstetrically crippled mothers, as well as the saving of their lives. If 1000 lives were conserved, it seems not improbable that, employing the same ratio (one-third), 20,000 women might annually be saved suffering and disability in the immediate future. I need say nothing of the gain, economic and domestic, that would accrue to success along these lines.

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* The Ingleby lectures delivered in the University of Birmingham on May 21st and June 4th, 1931. Lecture I. appeared in THE LANCET of May 30th.

† In this country the maternal death-rate is estimated in reference to every 1000 live children born. This is surely an incorrect method. It would be higher—probably 0·6—if all cases of stillbirth were included as they are in the Scandinavian countries.

I think that this lecture can, therefore, be best employed in the presentation of some ideas on the more important administrative aspects of a national maternity service. I want to make it quite clear, however, that they are my own views only, although I know they are strongly supported by some of the leading obstetricians in Great Britain.

My remarks are not intended to reflect adversely on anyone or anything. Medical practice and medical facilities pass through many stages of evolution, and so does the human mind. The suggestions advanced are merely for another great step forward, and I realise there will be many more in the future. It is, I think, generally admitted that large changes from the present somewhat disconnected and haphazard methods are overdue, and that criticism without construction does nothing more than hamper progress.

A Central Administrative Council.

All practising obstetricians are, I think, agreed that a fundamental requirement is that there should be an *ad hoc* central, independent, administrative body of small size—say 14 in number—and as far as possible autonomous in character. This council should consist of representatives of the Ministry of Health, public health authorities, the British Medical Association (representing general practitioners), the British College of Obstetricians and Gynæcologists (representing consulting obstetricians), and of pædiatricians, with an independent chairman. It will be noted that representation, at any rate at first, of the nursing service has been omitted, and this is because in my opinion the nursing personnel needs great alteration, and the introduction of conflicting interests at the start would be most undesirable.

Recommendations and reports of the central administrative council, like those of a Royal Commission, should be submitted directly to the Government—that is, in fact, to the Minister of Health. The Government would, of course, have the power to reject any proposal, but would be answerable to Parliament, and so to the country, for its actions and policy in this direction. Information and instructions should be distributed by the Ministry of Health, whi should be responsible for conformity on the part county councils and municipalities.

It is said that the establishment of this *ad hoc* bo would cut diametrically across the existing legislati procedures and authority. Parliament has co ferred the responsibility of preserving the health the nation on the Minister of Health who ac presumably, on the advice of his department; and l further legislation—as in the recent local governme Act—powers are devolved on county councils a municipalities. In all this there is no effecti arrangement made to ensure that those who kno most about the subject shall be consulted directl and the whole business is disintegrated, rather tha coördinated, among the numerous and heterogeneo bodies in which authority is vested. It is absolute essential that there should be some central authorit to amalgamate public and voluntary effort.

Since feeling is being stirred by all political partie because there are 3000 immediate maternal death yearly, what will be said when I assert the annu mortality is in reality 8000–10,000—for remote a well as immediate mortality should be considered— and that about 60,000 mothers are crippled annually Surely all political parties will be prepared to vote fo any Act of Parliament which would confer powe to deal with the question on a *competent* and *efficien executive body*, such as that suggested. At any rate it is by this course alone that an immediate and appreciable change will be effected in this appalling maternal holocaust. We scrapped procedure and legislation to save life in the late war. Let us do so again in this matter of maternal life and disablement.

General Organisation.

One of the great difficulties of organised maternity work at the present time is the scattered distributio of maternity practice. While in the large cities, especially those with teaching-hospitals, a considerable degree of coördination and coöperation is possible, if not actually in being, in the smaller urban and rural districts, adequate facilities are non-existent or imperfectly realised, and unified control is difficult to establish, and will become impossible unless some central council such as that I have indicated is brought into being.

What is needed first of all is a system of linking-up, much on the lines of military medical services in war-time. The whole country should be divided into areas in each of which one or more large bases, preferably with teaching-hospitals, are situated. Such a base could function for a district with a radius of 50 miles. County town hospitals in this area should act as field hospitals and the smaller outlying hospitals as casualty clearing stations and emergency centres.

The "competition" between voluntary and municipal effort must cease, and all resources must be pooled. At the present time, urged by the Ministry of Health to speed up facilities, certain municipalities are erecting large maternity hospitals and are conducting maternity homes, under the ægis of the medical officer of health without reference to the leading consulting and practising obstetricians in the places concerned, with the result that the beds are not available for teaching purposes, and are not always in the charge of expert obstetricians even in large cities.

It may be said in regard to such a position that, whereas the financial resources are at the disposal of the public authorities, expert knowledge and skill are almost entirely the monopoly of the voluntary organisations. Surely such inequalities of distribution of the fighting forces is contrary to the interests of the public; coördination and coöperation under unified control are essential. So it is that I press urgently for a concrete national service to secure the linking-up and the pooling of all resources—intellectual, material, and financial—in order that coöperation, coördination, and therefore general efficiency, which is often lacking to-day both in hospital arrangements and the medical, nursing, and administrative services, may be obtained.

I shall now turn to some of the details of a complete scheme, but first let me enumerate the desiderata for such an organisation, in order that I may afterwards enlarge on some of them.

Desiderata.

ACCOMMODATION FOR TRAINING AND PRACTICE.

1. *Base Hospitals.*—(*a*) For teaching and training of students and nurses. (*b*) With university laboratory facilities. (*c*) With maternity (minimum 40 beds) and gynæcological wards (minimum 30 beds). (*d*) With consultative antenatal, postnatal, and infant welfare clinics—internal and external. (*e*) With specialist facilities.

2. *Field Hospitals.*—(*a*) The larger general hospitals. (*b*) With clinical laboratory facilities. (*c*) With maternity wards (minimum 25 beds). (*d*) With specialist facilities. (*e*) Antenatal, postnatal, and infant welfare clinics—internal and external.

3. *Emergency Hospitals.*—(*a*) Cottage and small country town hospitals. (*b*) With one-quarter of the total number of beds for maternity cases—not less than 3 in all. (*c*) Antenatal and postnatal clinics—internal.

4. *Hostels for Nurses.*—(Domiciliary practice).

5. *Domiciliary Arrangements.*

PERSONNEL.

1. *Medical.*—(*a*) Consultants: obstetrician, physician, surgeon, radiologist, ophthalmologist, rhinolaryngologist, dentist, biochemist, pathologist, and pædiatrician. (*b*) General practitioner and anæsthetist.

2. *Nursing.*—Maternity sister superintendents, maternity sisters, maternity staff nurses, and maternity nurses. All to be fully certificated nurses with a certificate in obstetrics.

3. *Administrative.*—Central administrative council; Ministry of Health; local executive in each area.

Accommodation.

Accommodation is related to in-patients and out-patients—antenatal, natal, postnatal, and child welfare—to laboratory facilities, to undergraduate and post-graduate students, to medical and nursing indoor staff, and most importantly to the housing of the "district" nursing staff. The last I shall consider separately. With the "linked-up" system advocated the needs in different parts of each unit would obviously vary, but economy would be served by the facilities at the base being available for the rest of the unit.

BASE HOSPITALS.

The base hospital accommodation should be in one, but often necessarily in more than one, large general teaching-hospital in the city forming the centre of the unit. General hospitals are preferable in every way to special maternity hospitals for the following among other reasons:—

(1) *Finance.*—The cost of building a maternity and gynæcological department in, or attached to, a general hospital is much less than the cost of building a special maternity hospital, for one administrative block and other building arrangements in the former serve the whole. Moreover, no special maternity hospital, so far as I know, contains a gynæcological department; and it is absolutely essential that there should be gynæcological wards in association with every maternity department. The cost of upkeep, too, is more spread-out, and therefore less per maternity bed in a general than in a special hospital.

(2) *Special Consultative Facilities.*—Clinical, radiological, and laboratory (often university) coöperation is more readily available in a general than in a special hospital. Moreover, a sense of proportion is maintained, especially in antenatal work, for the student sees the consultative side of it when he is doing his medical clerkship since he accompanies his chief when he visits the maternity wards to examine cases of heart disease and pregnancy and other medical conditions, and to give advice concerning their management. Such excellent teaching facilities do not obtain in special hospitals. It is most desirable, as we have seen, that obstetrics should not be divorced from medicine and general surgery, any more than it should be separated from gynæcology.

(3) *Nursing Staff.*—In general hospitals the responsible staff all become fully certificated (S.R.N.), and the maternity wards are staffed by the same nurses as those in charge of the rest of the associated clinics—antenatal, postnatal, infant welfare, and gynæcological, as well as the medical and surgical.

The fully certificated nurse acquires a conscience for asepsis, working as she does in a surgical atmosphere, and, owing to her medical and gynæcological experience, she is competent to attend to all the antenatal and postnatal difficulties that may arise as well as the natal in which she should receive full obstetrical training. Enough was said in the first lecture to make it clear that there is a very considerable amount of constitutional as well as gynæcological disablement—matters quite outside the province of the ordinary midwife, yet requiring skilled nursing. In many special maternity hospitals the sisters—and even the matron—have the certificate of the C.M.B. only, and are not scientifically qualified, therefore, even to train the ordinary midwives in the modern requirements of maternity work.

It will be gathered that one of the essential features of a national maternity service should, in my opinion, be the employment of fully certificated nurses (S.R.N.) with a further obstetrical certificate. The present midwife type should be gradually eliminated. I shall deal with the matter more fully directly, for the present clear-cut difference of opinion on this question must be examined in all its aspects.

The famous, long-established maternity teaching hospitals, would, of course, function in base centres in association with general teaching hospitals, and we need not consider their facilities further, for during recent years the disadvantages attaching to them have been recognised and remedied, so far as this is possible. It must, however, be urged that no new maternity hospitals should be erected, as is now being done in many municipal areas. There is no justification for such expensive and far-from-ideal institutions. Better much that with coöperation between voluntary and should be reduced, and can be reduced, possibly by about one-quarter or one-third, there are few, I think, who knowing all the circumstances would be prepared to go so far as the Minister of Health[1] did when he stated that "not less than one-half—it might be more—of these maternal deaths were preventible." Until the state of affairs which I envisage has existed for two generations such an improvement is but an armchair dream. There must be a large irreducible minimum so long as the present high percentage of pre-adolescent crippling obtains among girls. Still, it may be possible by organised effort to save one life, now lost, in every 1000 labours—a saving to the country of about 1000 women a year. But it follows, too, from what has been said that women in danger who are saved are generally women seriously injured; consequently, putting aside the question of producing sound mothers, a properly organised scheme should include the prevention and treatment of obstetrically crippled mothers, as well as the saving of their lives. If 1000 lives were conserved, it seems not improbable that, employing the same ratio (one-third), 20,000 women might annually be saved suffering and disability in the immediate future. I need say nothing of the gain, economic and domestic, that would accrue to success along these lines.

I think that this lecture can, therefore, be best employed in the presentation of some ideas on the more important administrative aspects of a national
maternity service. I want to make it quite cl
however, that they are my own views only, wards.
I know they are strongly supported by s maternal
leading obstetricians in Great Britain. infection—
My remarks are not intended to r eated by expert
anyone or anything. Medical d for this reason
facilities pass through man be referred to base
and so does the huma uber of beds should be
advanced are merely
and I realise the IELD HOSPITALS.
It is, I think s would consist of the better-equipped
from the p als in the smaller towns. They should
hazard or their immediate district. In each there
without e a maternity department served by an
progr al clinic and in association with antenatal
s in the neighbourhood. The more serious
d difficult cases should be referred to the base
centre. Since at present in most cases maternity beds in these institutions are provisional, it would be advisable to build blocks affording proper accommodation and isolation facilities. Indeed, these would be the same as those obtaining at base hospitals but on a smaller scale. A standard plan, such as that illustrated, should be utilised, but adapted to local exigencies.

EMERGENCY HOSPITALS.

Emergency accommodation should be provided in the ordinary rural cottage hospitals, in which a few maternity beds should be maintained for the immediate district in which they are situated. Cases from them or the antenatal clinics close by could be referred to the base hospital, or in specially urgent cases assistance obtained therefrom.

ISOLATION IN OUTLYING AREAS.

In outlying urban and rural areas it would probably be found desirable to have one conveniently situated isolation hospital, or block, to meet the needs of a large district. This might be situated in the same town as that in which there is a considerable popula-

should be distributed by the Ministry of Health, which should be responsible for conformity on the part of county councils and municipalities.

It is said that the establishment of this *ad hoc* body would cut diametrically across the existing legislative procedures and authority. Parliament has conferred the responsibility of preserving the health of the nation on the Minister of Health who acts, presumably, on the advice of his department; and by further legislation—as in the recent local government Act—powers are devolved on county councils and municipalities. In all this there is no effective arrangement made to ensure that those who know most about the subject shall be consulted directly and the whole business is disintegrated, rather tha coördinated, among the numerous and heterogeneou bodies in which authority is vested. It is absolutel essential that there should be some central authorit to amalgamate public and voluntary effort.

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to deal with the question on es and for the work of
executive body.
it is antenatal, postnatal, and infant welfare
clinics scattered further away throughout the area
would be connected immediately with the field or emergency hospital, but difficult or doubtful cases would be referred to the base hospital directly. These clinics could all best be held in the same place, a pædiatrician or general practitioner, according to the locality, undertaking the infant welfare clinic.

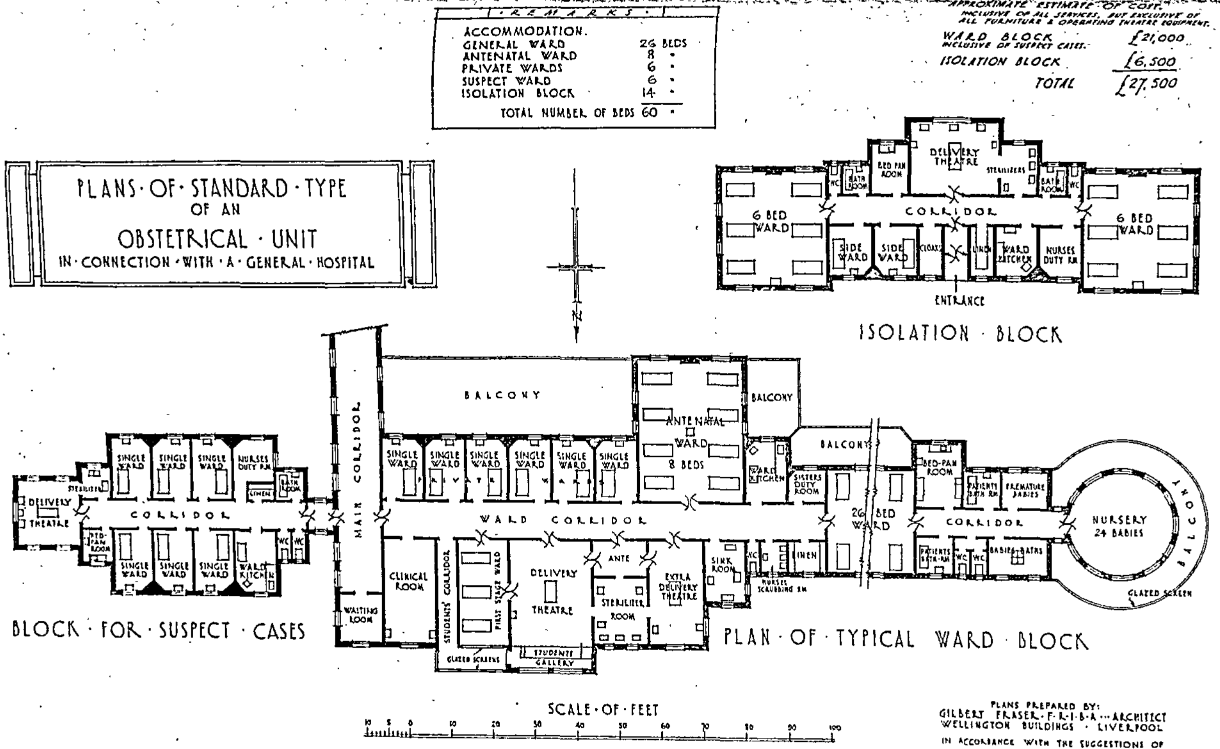
Special Services.

An efficient *anæsthetic service* should be maintained not only in the large base hospital centres but in the outlying districts, and this should be available in all areas for domiciliary practice. This is a matter that requires very careful consideration, in view of the inherent difficulties of anæsthesia, and the methods thereof in certain cases. A readily available *motor service* should be at the disposal of every doctor who wishes to transfer a patient to hospital. *Home-helps*, in those cities where a proper organisation for supplying them has been in existence, have proved of great value in domiciliary practice, and should be incorporated in the national maternity service.

Personnel.

MEDICAL.

Base Hospitals.—The control of base centres should be in the charge of a consultant obstetrician and gynæcologist, preferably of professorial rank, for this would give him direction of the laboratory for investigation and research, and bring university facilities and prestige into the national maternity service. He should, of course, work in full coöperation with his consultant colleagues in the various base hospitals, if there were more than one in the centre, and with the public health and nursing authorities. He should also be responsible for all the teaching arrangements. Numerous junior consultants should be in charge of the clinics and a pædiatrician should undertake the infant welfare work. The many other specialists already mentioned should be definitely coöpted to the service at the base. The



Plan of a standard three-division maternity department attached to a general teaching-hospital. The admission room, which should be near to the hospital entrance, is not shown. The main ward is "broken" in the plan. It will be noted that the three divisions are self-contained, and that in the suspect blocks beds are in single rooms only, in order that the cases may be removed after investigation to the isolation block or to the clean ward according to the findings. There is accommodation for a few private cases. Sunny open-air balconies should be provided in the "clean" division and in the isolation block; these are not shown in the plan of the isolation block. Attention may be called to the bed-pan-sterilising and storage room, the room for premature babies, the round nursery with *a big balcony and vita-glass roof, and to the arrangements* for students to observe labours in progress.

assistant staff should be available for consultative and operative work within the area of influence of the base centre.

In the field hospitals general practitioners would no doubt be in charge with juniors assisting in the department of obstetrics and the associated antenatal clinics.

It seems probable that in the future, with the improved undergraduate and post-graduate teaching that is now foreshadowed, and with the conferment of diplomas in obstetrics a very competent general level of knowledge and practice will be reached; but this should not lead to each rural centre becoming a base, for it must be remembered that the teaching will be conducted at the real base centres, and that the men who devote their lives to the subject will be stationed there specially equipped by experience, long training, and facilities for the more difficult part of the work. Moreover, it is here that physicians, pædiatricians, radiologists, and other specialists will be attached to the service. If, however, the scheme adopted be a really national one with the maintenance of a complete system of records, not only of maternal mortality but also of disablement, a check can be kept on the practice throughout the country; and this will become especially useful provided the chief obstetrical officer in each district has direct and confidential access to the central administrative council. In all the circumstances I have envisaged—namely, better undergraduate and post-graduate training, increased local facilities and friendly consultative coöperation—there need be little fear that the medical service throughout will be highly efficient and loyal to the interests of all concerned.

NURSING.

I now return to a part of the national maternity service which requires further consideration, and the more so in that opinion on the subject is divided, in order that once and for all I may examine the arguments that have been advanced for perpetuating a system which I hold to be wholly inadequate to the requirements of modern scientific obstetrics.

Many agree with the view that the advent of the fully certificated nurse-midwife is inevitable, but only in the sense that this natural evolution must, as they think, come to pass. At the same time advocates of the present type of midwife affirm that she is satisfactory, although a longer period of training would be an advantage.

This is a point of view I find it difficult to understand. Either the present midwife is all that can be desired, or she is not. If the latter be the case, and it is, as I shall show, impossible for many reasons to educate her further—say for two years—why should we not at once adopt the principle of the S.R. nurse-midwife?

I, myself, am of the opinion that a nurse should be State-registered before she is allowed to take an obstetrical certificate, and that as soon as practicable none other should be allowed to undertake maternity work. It is interesting to note that the idea of the S.R. nurse-midwife is accepted in the interim report of the Departmental Committee on Maternal Mortality (1930).

The chief arguments used by those who advocate the retention of the partly trained midwife are as follows.

(1) Since it is admitted that the present training is inadequate, the midwife, it is said, should have two years' training, and this should include some teaching in general medicine and surgery.

(2) The present midwife is best suited to the conditions of maternity practice of a domiciliary character: (*a*) she is unlikely to attempt to interfere with labour; (*b*) she has borne successfully and well the brunt of maternity practice for many years; (*c*) the high mortality-rate is not the fault of the midwife; (*d*) a maternity service could not be established without her—that is, the fully trained nurse would not undertake the ordinary domiciliary practice.

(3) In the Scandinavian countries, where midwives with two years' training are employed, the maternal mortality is less than half of that in this country.

The United States are quoted as having a high maternal mortality-rate, and by an advocate of our present midwifery system[2] it has been said that this is because "they have no midwives," and that "there is the peak of maternal mortality."

My *main thesis is, of course, maternal disablement*, but this is directly related to efficient practice, and indirectly to the number of maternal deaths, and further all of the nursing in connexion with maternal disablement is beyond the knowledge and training of the ordinary midwife.

Before developing my scheme for the employment of the State-registered nurse with an obstetrical qualification, I shall deal with the arguments submitted above by those who would retain the present type with further training.

(1) In respect of further training it is the opinion of many of us that a very large number of the women who present themselves for the present training, and are almost automatically accepted, are uneducable, especially in a scientific subject. It might be possible to get over this difficulty by a preliminary examination, or by taking only one in every ten applicants as obtains in Denmark; but in either case there would be few midwives in the north of England. Supposing, again, that the present class were accepted and a further period of one year's training in respect of medicine and surgery ordained. Where is this to be given? Certainly not in the big teaching-schools. It is doubtful whether any hospital giving a full training to nurses would admit them. It would mean a revolution of the nursing system, for many of those intending to take the full course would be excluded. Further, the present class of midwife could not afford two years' training. It must be noted that in Sweden the midwives are not taught anything at all about medicine and surgery during their two years' training, so Prof. Essen-Möller informs me. Moreover, in this part of the world the women are of a higher class than obtains in this country.

(2) (*a*) It is true that in this country the midwife does not interfere. In Scandinavia the midwives are taught to apply forceps. The real point is whether the former know enough to seek assistance *in proper time.* Some experienced midwives undoubtedly do; many do not; all should.

(*b*) The midwife has certainly done good work; but her predecessor was not hard to follow. The question, however, is this: can she give the same skilled attention as the fully trained nurse? She knows nothing of constitutional antenatal conditions, and nothing about postnatal. A nurse who has been trained in medical and gynæcological wards is familiar with both. Moreover, as I have already said, a nurse who had seen much of general surgery acquires a sense of surgical cleanliness and *technique* unobtainable in any other way.

(*c*) The low mortality attributed to midwives I hold to be a fallacy, for they call for medical assistance in about 25 per cent. of all cases *attended* by them.

(*d*) The impression of many that the domiciliary maternity service could not be conducted without the present type of midwife is, I think, erroneous. The question resolves itself into the following:—

(1) Are there enough fully certificated nurses holding an obstetrical qualification? There are. In Scotland, for example, in 1925–26, 496 women entered for the C.M.B. examination, of whom 351 were already fully certificated and 145 not certificated; in 1928–29, 403 women entered of whom only 40 were not fully certificated. Again, in England, in 1928, 2811 persons entered for the C.M.B. certificate, of whom as many as 1730 were already fully certificated (S.R.N.). It is truly said that only about 25 per cent. of the State-registered nurses with the C.M.B. certificate practise midwifery. But more are doing so every year. The "Jubilee" nurse-midwives are all fully certificated, and they do domiciliary practice. At any rate, there are enough fully certificated (S.R.N.) with obstetrical qualifications for the whole country if they would engage in domiciliary practice. This brings us to the second point.

(2) Can the inducements be made attractive enough to ensure that a sufficient number of fully trained nurses will engage in practice? I think they can, and I shall deal with this matter directly.

(3) Last, in support of the suggestion that midwives—that is, women with the C.M.B. certificate only—should be retained, with perhaps a longer period of training, it has been asserted by those who clearly have not studied the question fully on the spot that in the Scandinavian countries the maternal mortality is considerably less than our own[‡] and that this is due to the two years' training given to midwives. No statement could be more misleading and less true. So far as the midwives themselves are concerned, they are undoubtedly superior in general education and position in life to those in England and Wales—especially in the north of England. In Denmark about 30 in all are qualified annually, and of all those who apply for training only 1 in every 10 is accepted; some are of the position of teachers, doctors' daughters, and so on, and I am informed by Prof. Essen-Möller, to whom I am much indebted for information, that attempts are being made in Sweden to secure an even higher class, for among the fully trained nurses in that country are members of the aristocracy.

Two years' training of such a selected body of women is certainly an advance on what is done here. In Sweden, however, no training is given in general medical and surgical nursing; consequently the midwives must be handicapped in antenatal work, but this branch of maternity practice seems to be less necessary in Sweden than in Great Britain. The people of that country live in hygienic surroundings; they are very healthy and well-fed, and in this connexion it is interesting to note that the average quantity of milk consumed by each member of the community is six times greater in Sweden than in this country. Pelvic contraction is almost unknown. Prof. Essen-Möller writes: "Pelvic contractions are very rare . . . . we have no figures of the frequency of contracted pelvis in Sweden, which may prove that contracted pelvis in Sweden, which may prove that those cases are met with very seldom." Hence the low mortality from sepsis, which so often follows difficult and assisted labour.

Again, it is important to emphasise the fact that in Stockholm 94 per cent. of all confinements take place in the wonderfully equipped hospitals; in St. Malmo and Gothenburg about 85 to 90 per cent., and about 30 per cent. for the whole country. In England and Wales, so far as I can calculate, not more than 6 to 8 per cent. of all confinements take place in hospital. In Sweden, taking the country as a whole, about one-third of all cases are confined in hospital. In this country only about one-tenth of all cases are accommodated in hospital—a very notable difference. Moreover, it must not be forgotten that in the Scandinavian countries generally the mortality-rate is much higher—namely, 4·8 per 1000 labours in 1925—than in Sweden in 1922.

It is necessary to examine on its merits the demand made by some that the midwifery service of this country should be modelled on that obtaining in Scandinavia, and this I have tried to do. While there is no doubt that the Scandinavian midwives are superior to ours in that they are selected and have longer training, and being few in number can be carefully watched, the enormous fundamental differences, just indicated, in respect of the patient herself, account for the lower mortality-rate; this is not due to the midwife, as is so often suggested. It may, therefore, be confidently stated, then, that in Sweden the maternal mortality and disablement is low not only because of the good health of the people and hygienic conditions in which they live but also because pelvic contraction is almost unknown, and therefore sepsis is uncommon, and because a large proportion of all cases is confined in hospital under expert obstetricians. The midwives have little or nothing to do with the question.

Since in England and Wales sepsis is responsible for 40 per cent. of all deaths, and this phenomenon is almost always the culmination of a series of contributory factors among which pelvic contraction with "disproportion" takes a high place in the British Isles, it is clear that in this country also maternal disablement following trauma and sepsis will be much more frequent.

The statements made concerning America that "there is the peak of maternal mortality" "because they have no midwives" are, as I have said, inaccurate. In spite of the almost insuperable difficulties of securing uniformity of practice and registration in the different States, the figures are very carefully surveyed in the U.S. Government reports. According to the latest in my possession (1925) the following statistics of deaths from puerperal causes per 1000 live births are given among many others by way of national comparison.

	Ireland.	*England, Scotland, and Wales.*	*United States.*	*Denmark, Norway, and Sweden.*
All puerperal causes	8·2	5·7	6·2	4·8
Puerperal septicæmia	3·1	2·3	2·3	1·7
Other causes	5·1	3·4	3·9	3·1

The United States of America are not at the peak, even for civilised nations. Moreover, we find in the U.S. Government Report the following interesting statement:—

> "Comparing the rates of 1925 with those of 1915, *for* puerperal septicæmia, the United States (with registration area of 1915) had *the same rate* for both years, England and Wales an increase of 6·7 per cent. in its rate. For other puerperal causes the United States showed an increase of 2·7, England and Wales a decrease of 7·4."

I am very grateful to Prof. F. S. Newell, of Harvard University, for much valuable information on the subject.

If any conclusion can be drawn from the above statements it is that America practises what Dr. John Fairbairn calls "meretricious aids" more cleanly than we do, and that our antenatal system is more general than hers. Anyway, there is no justification for such misleading statements as those made.

[‡] This is true of Sweden only, in which country the figures for 1922 show the mortality is almost exactly one-half (2·5 per 1000 labours) of that obtaining in England and Wales. Yet it is probably even less, comparatively, for in Sweden *all labours* are taken into account, but abortions and ectopics are excluded; whereas we include the latter and only count maternal deaths in women who give birth to live children—a quite ridiculous standpoint, for many serious cases end in death both of mother and child. In addition, as I have shown, the maternal disablement in Sweden is negligible.

I have directed special attention to the question of the nursing personnel, not because I wish in any way to assert that our present mortality and disablement rates are due entirely to the present type of midwife *per se*, but because I think it advisable to expose the nature of the evidence which is put forward in support of the claim that she should be retained, and because I do not believe it to be possible to have an efficient maternity service without fully certificated nurses. I may be asked what I mean by this. Let me try to explain.

First, the present type of midwife is anomalous; she is a makeshift between the completely untrained and the fully trained nurse. She cannot, therefore, be regarded by medical practitioners as a colleague in the sense that the fully certificated nurse is. We all know, too, how a surgically competent nurse prevents any laxity on the part of the surgeon or practitioner. She is an influence for good wherever she works, whether it be in a surgical theatre or the home of the patient.

Secondly, no training that can be given to the present midwife—even supposing it were possible for her to afford the expense and that teaching-hospitals were willing to take her—will make much difference to her efficiency. Nor will additional training evoke in her that spirit of comradeship and discipline and willingness to coöperate which are such prominent traits in fully trained nurses, and which are essential to a linked-up scheme in which S.R. nurses will be working within the sphere of influence of their training schools, if what I propose comes to pass.

CONDITIONS AND ENVIRONMENT OF WORK OF THE S.R. NURSE-MIDWIFE.

It is believed that of the State-registered nurses who take the C.M.B. certificate at the present time in England only about 25 per cent. take up obstetrical practice subsequently. We know, however, that in Scotland relatively few women without a full training now take the C.M.B. certificate, and that all the "Jubilee" midwives, with their excellent record, which I have not time to present or discuss, are State-registered, and I have shown that there is no lack of State-registered nurses who take the C.M.B. certificate in England and Wales. What, then, are the causes that lead to their taking certificates but not practising?

First, it is certain that most of the S.R.N. who take the C.M.B. certificate do so because it is necessary or an advantage to possess this qualification if they wish to occupy the higher posts in their profession. Second, medical officers of health appear to make it a *sine qua non* that S.R.N. applying for posts of health visitors shall have the C.M.B. certificate also. In discussing this matter not long ago with the medical officer of health of Liverpool, I suggested that it would be far better not only to insist on this, but also to accept no nurse until she has been for three years in obstetrical practice under a national maternity scheme. Third, the conditions of domiciliary practice are not such as to render the work attractive to educated women; and it is with the last matter I shall now deal.

The conditions essential to the service envisaged, and attractive to the S.R.N., comprise satisfactory arrangements in respect of: (1) housing and feeding; (2) responsibility, and hospital atmosphere and discipline; (3) post-graduate facilities; (4) regular work and holidays; (5) adequate payment and pension; (6) promotion. The last four requirements are relatively simple problems; the first two comprise the crux of the situation.

Hostels should be established throughout each area. These should be occupied by a sister and three to five nurses; and attendant service should be provided. Here the nurses would live in companionship, relieving each other after definite periods on duty, and the atmosphere and discipline of hospital would be maintained. The freshly qualified nurse would work for a time in a hostel in close association with her teaching school to which she would go for regular post-graduate teaching. Later she would be moved further afield. Extended experience and promotion would follow.

Conditions of work.—The nurse should be taught to realise that she is a link in the system whereby the maternity service would be carried on, and that she is as it were an outpost in her area, with an experienced sister behind her and responsible medical assistance always available. She should have periods off duty and regular holidays, and in country districts small cars should be at the disposal of the hostels, that the nurse may not be physically tired. Her material comforts would be catered for and she would be cared for when ill, another being on hand to take her place. Each hostel would supply the nurses required at the antenatal and other clinics—these, indeed, might be held in a specially built room attached to the hostel. Moreover, arrangements could be made for the district nursing to be conducted by the hostel nurses in turn, for periods of, say, three months at a stretch. This experience would be prized, and would maintain their interest in general medicine and surgery.

I believe a really efficient service could be constructed on these lines, and as I have said the expense would not be great—possibly less than the amount expended to-day.

Summary.

In conclusion, it seems to me, then, that there must be a central administrative council as far as possible autonomous, and that in the ideal maternity scheme we must aim at coöperation and coördination of the best type. This can only be secured by amalgamating all the resources of the country, and by ensuring that the service shall be fully linked up in limited areas, and that the personnel shall be as efficient and mutually compatible as it is possible to make it. Now is the time, when the occasion urgently demands and the opportunity presents, for a great step forwards, not only to save the maternal lives but also to ensure that by skilled attention, rightly utilised, crippled mothers shall be fewer than they are to-day.

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ST. BARTHOLOMEW'S HOSPITAL APPEAL.—The governors last week decided that until economic conditions improve it would be advisable to reduce to a minimum the activities and expenditure in connexion with the appeal for a million pounds for reconstruction. It was also decided to appoint a committee of not more than five persons with special financial experience to advise upon financial questions as occasion may arise.

ESTIMATION OF THE BASAL METABOLIC RATE

FROM FORMULÆ BASED ON PULSE-RATE AND PULSE PRESSURE.

BY ANNABELLA M. GALE,* M.D., B.SC. GLASG.,
AND
C. H. GALE, M.INST.C.E., A.R.I.B.A.

IN 1922 J. Marion Read [1] of San Francisco suggested that a simple clinical means of estimating basal metabolic rate might be obtained by making use of the correlation between basal metabolic rate, pulse-rate, and pulse pressure. He suggested the following formula :—

$$\text{B.M.R.} = 0{\cdot}683\,(\text{P.R.} + 0{\cdot}9\,\text{P.P.}) - 71{\cdot}5,$$

but subsequently [2] altered the formula to :—

$$\text{B.M.R.} = 0{\cdot}75\,(\text{P.R.} + 0{\cdot}74\,\text{P.P.}) - 72.$$

In 1926 Cameron, Kitchen, and McRae, of Canada, tested Read's formula during an investigation into the basal metabolic rate of young adults, and concluded "that the results do not justify the use of the formula clinically." [3]

The determination of the basal metabolic rate is of the utmost importance clinically, but it is so involved that it can only be estimated in hospitals provided with a large scientific staff and the necessary apparatus, and it is out of the question for the general practitioner. It was thought that if a formula based on pulse-rate and pulse pressure could be evolved and could be shown to give reliable results, it would bring into the hands of the general practitioner a new method of studying disease at the bedside. With this end in view a letter was sent to Dr. Read which met with a most gratifying response. He forwarded all his original figures and permission to make full use of them. This most kind and generous action made the following inquiry possible. Prof. Cameron, of Manitoba University, was also kind enough to supply the unpublished figures of his test of Read's formula. The Russell Sage Institute of Pathology, New York, very kindly supplied a full set of their papers dating back to 1915. The basal metabolic-rate determinations taken in the Russell Sage Institute are conducted in the most scientific and accurate manner, and it is most unfortunate that their results could not be used, as observations of the pulse pressures are not included.

In Prof. Cameron's 134 cases no less than 55·6 per cent. are included in the zone + 10 per cent. to −9·9 per cent. basal metabolic rate and, taking into account that Prof. Cameron's results were fully 10 per cent. or 15 per cent. higher than Dr. Read's, we decided to deal with Dr. Read's cases only. To facilitate the search for a formula showing the relationship between the basal metabolic rate, pulse-rate, and pulse pressure, Table I. has been compiled from 1006 observations by Dr. Read; this differs slightly from the table given in his pamphlet.[4] From the values given in Table I. the various tables and charts in this paper have been constructed.

In Fig. 1, the mean basal metabolic rate for cases in the zone + 10 per cent. to + 0·1 per cent. is taken as + 5 per cent. and in the zone + 20 per cent. to + 10·1 per cent. as + 15 per cent. and so on. In zones in which only single cases occur the observed basal metabolic rate is taken. Now if the basal metabolic rate values are taken as ordinates, and the results of a formula as abscissæ, and in a straight line formula, these will increase simultaneously by equal amounts if suitable scales be chosen—it follows that the ideal straight line formula will coincide with the dotted line A.A drawn at an angle of 45° (Fig. 1). The results of Dr. Read's formula have been plotted on the chart (Fig. 1) and it is seen that it is too flat; the results in the upper zones are too low, and in the lower zones not low enough. On the same chart are shown the curves for pulse-rate and pulse pressures and also for the sum of pulse-rate and pulse pressure. If a dotted line B.B is drawn through the curve P.R. + P.P. parallel to the dotted line A.A the close approximation is at once seen. This dotted line B.B is 111 on the scale to the left of the chart above the dotted line A.A. The formula P.R. + P.P. − 111 = basal metabolic rate is thus indicated, and further investigation proves it satisfactory. The formula is plotted on the chart and may be compared with that of Dr. Read. The formula and results are also shown in Table II.

TABLE I.

Observed B.M.R. per cent.	Mean values.					
	P.R.	P.P.	P.R. + P.P.	P.R. × P.P.	P.R. + 0·74 P.P.	Cases.
+132	164	80	224	13,120	223·2	1
+124	159	74	233	11,766	213·8	1
+112	132	110	242	14,520	213·4	1
+103	121	84	205	10,164	183·2	1
+100 to +90·1	116	74·5	190·5	8,642	171	2
+ 90 to +80·1	117	63	180	7,371	163·6	2
+ 80 to +70·1	109·8	78·1	187·9	8,575	167·8	13
+ 70 to +60·1	104·3	68·5	172·8	7,145	155·1	29
+ 60 to +50·1	103	61	164	6,283	148·2	46
+ 50 to +40·1	99·7	58·2	157·9	5,803	142·7	73
+ 40 to +30·1	94·8	53·3	148·1	5,053	134·3	108
+ 30 to +20·1	85·7	51·3	137	4,396	123·7	123
+ 20 to +10·1	80	45·7	125·7	3,656	113·8	141
+ 10 to + 0·1	72·5	42	114·5	3,045	103·3	166
− 0 to − 9·9	70·2	38·9	109·1	2,731	98·9	137
− 10 to −19·9	66·8	37·4	104·2	2,498	94·3	119
− 20 to −29·9	60·5	32·8	93·3	1,984	85·1	38
− 30 to −39·9	60	28·5	88·5	1,710	81·8	4
−40·4	60	38	98	2,280	88	1
Total cases						1006

TABLE II.—*Summary. Total Mean Percentage.*

Formulæ.	Error not more than—			
	5 %	10 %	15 %	20 %
	%	%	%	%
1. Gale's formula. $\text{P.R.} + \text{P.P.} - 111 = \text{B.M.R.}$	27·5	45·6	57·4	73·7
2. $1{\cdot}06\,(\text{P.R.} + 0{\cdot}74\,\text{P.P.}) - 105 = \text{B.M.R.}$	21·8	45·1	66·2	73·1
3. $\frac{\text{Log}\,(\text{P.R.} + 0{\cdot}74\,\text{P.P.} + 200) - \text{Log}\,301}{0{\cdot}00113} = \text{B.M.R.}$	26·8	44·6	63·4	70·6
4. $\frac{\text{Log}\,(\text{P.R.} \times \text{P.P.} + 6000) - \text{Log}\,8900}{0{\cdot}00257} = \text{B.M.R.}$	24	44·1	55·1	62·6
5. *Read's formula.* $0{\cdot}75\,(\text{P.R.} + 0{\cdot}74\,\text{P.P.}) - 72 = \text{B.M.R.}$	15·3	25·9	36·1	43·6
6. $0{\cdot}5\,(\text{P.R.} + 0{\cdot}74\,\text{P.P.}) - 38 = \text{B.M.R.}$	7·1	15·9	23·1	30

The formulæ should not be judged by the number of cases falling within a given percentage of error, but by the percentage of cases falling within a given percentage of error over the whole of the zones. By the first method the results would be dependent on the number of cases occurring in the different [illegible] zones; by the latter method the result is independent of the number of cases in the different zones.

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* Mrs. Gale died in November, 1930.

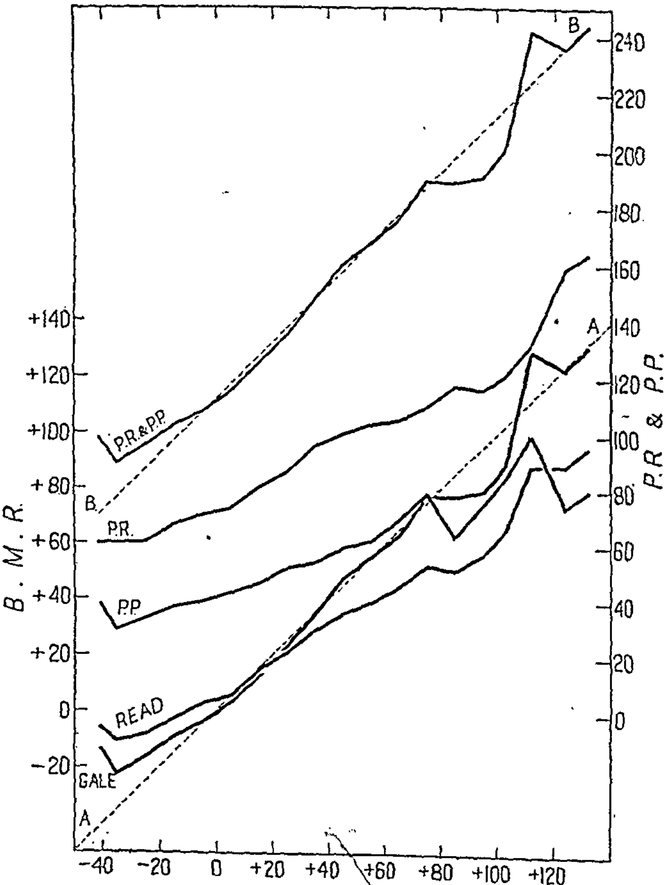
The next question to be considered is the relative influence of pulse-rate and pulse pressure on the metabolic rate. The error in determining pulse-rate is likely to be less than in determining pulse pressure. There is a very marked tendency for these to vary in opposite directions and the variation of pulse-pressure is slightly greater than that of pulse-rate, but the use of a fractional part of the pulse pressure seems scarcely justified until a greater number and more accurate determinations of basal metabolic rates are available. Dr. Read has pointed out[4] "the idea that the pulse pressure varies directly with the stroke volume is not new. Erlanger and Hooker in 1904, after extensive studies, suggested that the velocity of blood flow could be represented by the product of pulse-rate and pulse pressure." The results of the formula

$$\frac{\text{Log}\,(\text{P.R.} \times \text{P.P.} + 6000) - \text{Log}\ 8000}{0{\cdot}00257} = \text{B.M.R.}$$

are shown in Table II, in which formulæ 1, 2, 5, and 6 are straight line formulæ and formulæ 3 and 4 are curves. It shows the various formulæ compared on a percentage basis calculated from the whole of the 1006 individual cases. The formulæ are placed in their order of merit.

It must be remembered that for the purposes of this investigation the accuracy of the observed basal metabolic rate has been taken for granted, but it appears that the personal equation should be taken into account as, although the observations of Dr. Read and Prof. Cameron were made by a similar method, the portable respiration calorimeter yet, as already pointed out, Cameron's results are fully 10 per cent. or 15 per cent. higher than Dr. Read's. It is much to be regretted that observations suitable for this research are not available from the Russell Sage Institute of Pathology, New York, since admittedly their apparatus gives the most accurate result.

FIG. 1



Calculations of basal metabolic rate (B.M.R.) from mean values of pulse-rate (P.R.) and pulse pressure (P.P.) [illegible] Table. This chart is explained in the text.

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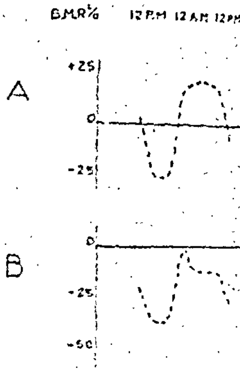
FIG. 2.



The diurnal wave.

SUMMARY.

1. Six formulæ have been calculated and tested on the data of 1006 cases collected by Dr. Read and his staff during the estimation of the basal metabolic rate by the portable respiration calorimeter.

2. Gale's formula P.R. + P.P. − 111 = B.M.R. has been found to give on the whole the most satisfactory results, as seen in Table II., where the total mean percentage of the percentages of all the zones of cases within 5 per cent. error of the observed basal metabolic rate is 27·5 per cent., and of cases within 20 per cent. error, 73·7 per cent. Allowing for the many possibilities of error in the observations of clinical data, this appears to be an excellent result.

3. This method of calculating the basal metabolic rate by the addition of the pulse-rate and the pulse pressure and subtracting 111 make it admirably adapted for use at the bedside by the general practitioner.

THE TWENTY-FOUR HOUR CURVE.

Fig. 2 shows the typical curves of observations made of two subjects at frequent intervals during three years. The curves were fairly constant from day to day. The peak in curve B at about 12 A.M. (noon) was very persistent, but seldom rose above normal. In all cases examined there was a rise from the minimum, at about 4 A.M. to 5 A.M., to the maximum, at about 12 A.M. to 1 P.M., and a tendency to remain steady between 2 P.M. and 8 P.M. For this reason the afternoon appears to be the best time for taking the basal metabolic rate. The curves were obtained by observations taken every two hours by Gale's formula, in some cases without waking the subject. It is doubtful if the curves could be obtained by any other method.

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THE PATHOLOGY AND ÆTIOLOGY OF BRAIN ABSCESS.*

By William Evans, M.D., M.R.C.P.Lond.,
MEDICAL FIRST ASSISTANT, LONDON HOSPITAL.

(*Concluded from p. 1235.*)

(B) Hæmatogenous Spread.

In this section are included cases in which brain abscess had followed the transmission by the blood stream of infected material originating in a distant focus of suppuration. This distant source of infection must be regarded as a frequent and important factor in the ætiology of brain abscess, as it provided the cause in 46, or 23·7 per cent., of the 194 cases. In 22 instances the abscess had formed as a complication of intrathoracic suppuration, and in 24 cases brain abscess had followed extrathoracic suppuration. As the abscess occurring in the latter group of cases differs in many respects from that found in the former, each will be described separately.

METASTATIC BRAIN ABSCESS RESULTING FROM INTRATHORACIC SUPPURATION.

Cerebral abscess established as a complication of chronic intrathoracic suppuration is of considerable interest in that it is usually the sole manifestation of pyæmia. Of the chest conditions which are liable to be complicated by brain abscess bronchiectasis is by far the most important. Empyema may produce a similar result, but much less frequently. The peculiar tendency of this group to form a chronic type of brain abscess, generally solitary and almost invariably the only lesion indicative of a pyæmia, warrants its consideration in a separate subdivision. The abscess is embolic in character. Presumably, micro-organisms or fragments of infected thrombus in a tributary of the pulmonary vein are transported in the blood stream and become lodged in a terminal radicle of the cerebral arteries. Acute localised encephalitis results, and a brain abscess is formed.

(*a*) *Brain abscess complicating chronic bronchiectasis.* Brain abscess is a fairly common complication of chronic bronchiectasis. An examination was made of 321 cases in which *chronic* bronchiectasis had been found at necropsy, and brain abscess was discovered in 11, or 3·4 per cent. No brain abscess could be demonstrated at necropsy in 494 cases of *acute* purulent bronchiectasis. It will be seen, therefore, that it is the chronic form of bronchiectasis which possesses the peculiar tendency to give rise to this complication. In the present series there were 17 cases, so that 8·7 per cent. of all abscesses were due to chronic bronchiectasis. This percentage would be considerably raised if the 24 cases of cerebral abscess occurring in general systemic pyæmia were ignored as being clinically unimportant; bronchiectasis would then be found to be the cause of brain abscess with a frequency next in order to that of middle-ear and mastoid infection. Further analysis of the figures shows that when brain abscess complicated intrathoracic suppuration it was secondary to chronic bronchiectasis in 77·3 per cent. of the cases.

The abscesses occurred in 13 males and 4 females. They tended to be more frequent in adult life; six subjects were over 40 years of age, whilst all were between 19 and 51 years. Amongst the 17 cases the abscess was single in 11, or 64·7 per cent., and two or more in number in the remaining 6. They were generally of a large size when solitary, but when multiple they tended to be smaller, varying in size in individual cases from a pinhead to a cherry. The seat of the abscess was usually in the cerebrum, and only very rarely did it form in the cerebellum. The incidence was as follows: centrum semi-ovale 76·2 per cent., temporo-sphenoidal lobe 9·5 per cent., cerebellum 9·5 per cent., pons 4·8 per cent. Thus the centrum semi-ovale, or the white matter in the cerebral hemisphere, proved to be a prevalent and favourite site for this type of abscess. Centrum semi-ovale, *per se*, is not, however, a sufficiently accurate term to define the position of the abscess; the abscess may in this area be frontal, occipital, or parietal; these three sites are given in order of frequency. The abscess did not form with greater frequency on either side; it was on the right in seven, on the *left* in seven, and on both sides in three.

In 16 cases the brain abscess proved at necropsy to be the only evidence of a pyæmia, but in one case an embolic abscess in the right kidney and a large septic infarct in the upper pole of the spleen were also present.

The bronchiectasis in two cases had followed infection of the lung by a foreign body in the air passages; in one case it followed pneumonia; in one it followed direct spread of the infection from a subdiaphragmatic abscess; in two it was tuberculous in origin; in 11 the cause was not definitely ascertained. No satisfactory explanation can be advanced to show why a brain abscess so rarely complicates pulmonary tuberculosis with cavity formation and extensive destruction of lung tissue, in comparison with its relatively frequent occurrence as a complication of chronic bronchiectasis resulting from any other cause. But the fact that two cases fall in this series should emphasise that brain abscess is not an extremely rare complication of bronchiectasis following pulmonary tuberculosis.

The formation of a brain abscess was not determined by the extent of the bronchiectasis in the lungs. The tendency appeared to be only slightly greater in extensive lesions where large and prominent fusiform and saccular bronchiectatic cavities were present than in the less pronounced examples of bronchiolectasis, where the condition was none too obvious when viewed with the naked eye, but was conclusively proved to be present by microscopical examination. This has been conspicuous in the present investigation which disclosed the lesion in the lung to be slight in 7 of the 17 cases; in 4 cases bronchiolectasis had provided the cause, and it cannot be too greatly emphasised that, where a brain abscess has been found at necropsy and no apparent primary cause is immediately discovered, a diligent search should be made in the lungs for possible focal or diffuse areas of chronic bronchiolectasis.

It is significant that with only two exceptions the bronchiectasis in all cases involved the lower parts of the lungs, was invariably confined to the lower lobes, and was usually unilateral. In the two exceptions the bronchiectasis was confined to the apex of the lung, and in both the bronchiectasis was tuberculous.

No advantageous conclusion can be drawn from a study of the relationship between the bacteriology of bronchiectasis and the resulting brain abscess. More than one variety of organism was generally present, and a culture of the abscess content invariably grew similar colonies to those cultivated from the bronchiectatic cavity which provided the initial zones; by the latter method the result is independent of the number of cases in the different zones.

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* Based on a paper awarded the K. E. D. Payne Prize at the London Hospital in 1927.

The next question to be considered is the relative influence of pulse-rate and pulse pressure on the metabolic rate. The error in determining pulse-rate is likely to be less than in determining pulse pressure. There is a very marked tendency for these to vary in opposite directions and the variation of pulse-pressure is slightly greater than that of pulse-rate, but the use of a fractional part of the pulse pressure seems scarcely justified until a greater number and more accurate determinations of basal metabolic rates are available. Dr. Read has pointed out [4] "the idea that the pulse pressure varies directly with the stroke volume is not new. Erlanger and Hooker in 1904, after extensive studies, suggested that the velocity of blood flow could be represented by the product of pulse-rate and pulse pressure." The results of the formula

$$\frac{\text{Log (P.R.} \times \text{P.P.} + 6000) - \text{Log } 8000}{0{\cdot}00257} = \text{B.M.R.}$$

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. ABSCESS RESULTING FROM EXTRA-
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abscess in all cases placed in this group
d in a generalised or systemic pyæmia,
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of all cases of brain abscess, clinically it is
ed as the least important of all causes, because
prevailing pyæmia invariably proves fatal, the
al areas of suppuration in the brain and other
gans forming as a terminal event.

Brain abscess is not a common lesion in systemic pyæmia; investigation of 576 consecutive examples at necropsy of such pyæmia, complicating osteomyelitis in 113, otitis media in 46, puerperal sepsis in 49, and other lesions in 368, demonstrated brain abscess in only 15, or 2·7 per cent. Septic infarcts in the spleen and kidneys, and pyæmic abscesses in the lungs and small and large intestines were far more constant features.

This type of brain abscess may be single or multiple. In 13 cases more than one abscess was present. In 11 cases the abscess was single. The abscess in two cases had reached large dimensions. In five cases the actual size of the abscess was not recorded. In 17 cases the abscess was small, varying in size from a pinhead to a pea; in many of these cases a diligent search was made at necropsy in order to disclose their presence. The position of the abscess varied greatly; most commonly it was in the centrum semi-ovale or in the cerebral cortex; less commonly it occurred in the cerebellum, pons, the basal ganglia, or in the external and internal capsules. The causes of the pyæmia, the size and site of the brain abscess, and the sites of abscesses forming in other tissues are given in Table V. Reference to this Table will show that osteomyelitis supplied the most common

this investigation the accuracy of the observed basal metabolic rate has been taken for granted, but it appears that the personal equation should be taken into account as, although the observations of Dr. Read and Prof. Cameron were made by a similar method, the portable respiration calorimeter yet, as already pointed out, Cameron's results are fully 10 per cent. or 15 per cent. higher than Dr. Read's. It is much to be regretted that observations suitable for this research are not available from the Russell Sage Institute of Pathology, N
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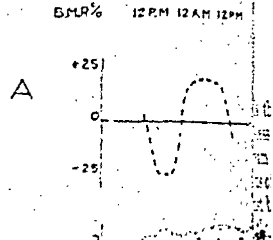
FIG. 2.



...as in the socket of a
P cases in the chest wall;
lungs. Widespread pyæmia
cases. Miliary actinomycotic
the leptomeninges were found scattered
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s formation was not present.

TABLE V.—*Further Details concerning Brain Abscesses in Cases of General Systemic Pyæmia.*

Initial lesion.	B.A.	Site.	Size.	Sites of accompanying pyæmic abscesses.
Infect. endocarditis.	M.	c.s.o. cereb.	Small.	Heart, spleen, S.I.
Puerperal sepsis.	1	c.s.o.	Minute.	Heart, spleen, kidney, suprarenal body, lung, knee and sternoclav. joints.
Comp. frac. patella.	1	c.s.o.	Miliary.	Heart, lung, suprarenal body, spleen.
Otitis media.	M.	c.s.o.	Pea.	Heart, lung, spleen.
Uterine sepsis.	1	c.s.o.	?	Lung, spleen, liver.
Suppurating ovarian cyst.	1	c.s.o.	?	(Head alone exam. at necropsy.)
Frontal sinusitis.	M.	Temp.-sph. lobe, c.s.o.	Miliary.	Lung, liver.
Appendicitis.	1	c.s.o.	?	Lung, kidney.
Erysipelas.	4	Temp.-sph. lobe, pons.	Pea.	Heart, spleen, thyroid.
Osteomy. of ilium.	M.	c.s.o., cereb.	?	Lung, spleen.
Perf. duodenal ulcer.	M.	Cereb. roof of lat. vent.	Small.	Lung, kidney.
Cellulitis of eyelid.	1	Temp. lobe.	?	Lung, kidney, muscle, S.I.
,,	2	Temp.-sph. cereb.	1·5 cm. diam.	Lung.
Abscess of breast.	1	c.s.o.	1·3 × 5 cm.	Lung, spleen, kidney, S. and L.I.
Osteomy. of fibula.	M.	Cerebral cortex.	Miliary.	Lung, kidney, S. and L.I.
Pinprick wound.	M.	Cerebral cortex, pons, c.s.o.	Small.	Heart, lung, spleen, kidney.
,,	1	Cereb.	0·6 cm.d.	Lung.
Osteomy. of tibia.	1	Ext. capsule.	Miliary.	Heart, lung, kidney, thyroid, S.I.
,,	M.	Cerebral cortex.	1 cm. diam.	Heart, spleen, liver, S.I.
Osteomy. of femur.	1	Ext. capsule.	Miliary.	Heart, spleen, kidney, liver, thyroid.
Infec. endocarditis.	M.	Cerebral cortex. c.s.o., cereb.	Pinhead.	Heart, spleen, kidney, liver, thyroid, S. and L.I., skin.
Unknown.	M.	c.s.o.	Miliary.	Heart, spleen, kidney, S.I., skin.
Osteo-arthritis.*	1	c.s.o. (parietal).	9 cm. diam.	Thyroid.
Nasal septum.†	M.	Cerebral cortex.	Pinhead.	Spleen, S. and L.I.

* Purulent osteo-arthritis of hip-joint.
† Resection of nasal septum with purulent rhinitis.
B.A. = number of brain abscesses; c.s.o. = Centrum semi-ovale; M. = multiple; Cereb. = cerebellum; L. and S.I. = large and small intestine.

Secondary infection of a neoplasm.—Such a source in the ætiology of brain abscess must be exceedingly rare. The reports of 115 necropsies in which neoplasm of the brain was present demonstrated that in no instance had suppuration occurred in the brain and ed an abscess. Of these neoplasms 82 were nata, 15 secondary carcinomata, 10 secondary mata, and eight angeiomata. In one case a hæmorrhagic and necrotic deposit of carcinoma centrum semi-ovale of the brain was secondary growth in the suprarenal body. On micro- l examination the growth in the brain was to be infiltrated with leucocytes but abscess on had not resulted.

dary infection of a tuberculoma.—It appears e present investigation that suppuration in a tuberculoma is rare. No such example l *in the series of 14,534 necropsies examined.* osed frequency appears to depend upon f microscopic examination. Thus the of caseous material in a tuberculoma may naked eye an appearance closely simulating suppuration. Further it may be found at that a focus of suppuration in the cere- where a tuberculoma is most commonly *is* associated with generally or partially eminated tuberculosis. Where middle-ear and mastoid disease is excluded it is not unreasonable to conclude from the naked eye examination alone that the suppuration has occurred in a pre-existing tuberculoma. The second source of fallacy is illustrated by one case in this series.

During life a male, aged 32 years, had suffered from pulmonary tuberculosis; necropsy showed cavitation in the apex of the left lung with slight purulent bronchiectasis and nodules of broncho-pneumonic consolidation. Miliary granulomatous tubercles were scattered over the under surface of the diaphragm and throughout the spleen and kidneys. A solitary abscess was discovered in the left lobe of the cerebellum, and the middle ears and mastoid antra were found to be clean and free from infection. A somewhat natural deduction was made at necropsy that the abscess had formed as the result of suppuration occurring in a tuberculoma. Histological examination of its wall, however, proved conclusively that it was a simple abscess, and it showed no evidence of tuberculosis. It had evidently occurred as a complication of the bronchiectasis.

(C) Method of Spread Doubtful.

In two cases, although the source of the infection was evident, the path to the brain remained obscure. In one case a large abscess had formed in the left frontal lobe in a child aged 6 years. A small subperiosteal abscess was also present in the left coronal suture, but appeared to be unconnected with small abscesses situated under the adjacent dura. Muco-pus in the left antrum of Highmore seemed to have provided the source of infection, but its path to the brain was not evident. In the other case an abscess (5·5 cm. diam.) was found in the right frontal centrum semi-ovale in a man aged 47 years. Pus was found in both antra of Highmore, and in the frontal and sphenoidal sinuses. There was no thrombosis of the cranial venous sinuses. Examination of cultures prepared from the brain abscess and from the antrum disclosed a pure growth of streptococci of remarkable length and arranged in chains. This finding would appear to establish the accessory nasal sinuses as the source of infection, but in this case also the method by which the infection spread to the brain was not obvious.

(D) Source, and therefore Method of Spread, Doubtful or Unknown.

In three cases a source was not found at necropsy, but the history suggests that the abscesses were pyæmic. In one case, a young adult aged 17, an abscess was found in the left side of the pons. There was a history of pneumococcal arthritis of both hips following an attack of pneumonia two years before death. Necropsy showed a healed arthritis of the left hip-joint and deep scars about the hip. A man, *aged* 32 years, with a streptococcal abscess in the left parietal centrum semi-ovale had suffered from severe quinsy five months before. In a man, aged 46 years, with an abscess in the left frontal centrum semi-ovale there was a history of carbuncles 14 months before.

In two cases there was a history suggesting infection of the ear, but the middle ears and mastoid antra were found to be healthy at necropsy. In a boy, aged 14 years, there was an abscess in the left lobe of the cerebellum, and a doubtful *history of* discharge from the ear was obtained. In another boy, aged 19 years, there was an abscess in the left temporo-sphenoidal lobe; there had been earache four months before death, and wax had been removed from the left ear. In neither of these cases was the nose and its accessory sinuses examined at necropsy. In the second case the necropsy was confined to the head.

In ten cases no source of infection was found at necropsy and there was no history of a possible source. In one case, where an abscess was found in the right frontal lobe, the necropsy was confined to the head and the nasal accessory sinuses were not examined. In nine there was a full necropsy, but in two, examination of the accessory nasal sinuses had been omitted. The sites of the abscesses have been indicated in Table VI.

TABLE VI.—*Further Details in 17 Cases where the Method of Spread and Source of the Infection were Doubtful or Unknown.*

Sex and age.	Site of brain abscess.	Size or diameter (cm.).	Nature of possible source of infection.	Condition of foramen ovale.
M. 47	Rt. fr. c.s.o.	5·5	Purulent accessory nasal sinuses.	P. p.
F. 6	Lt. fr. c.s.o.	Large.	Muco-pus in antrum of Highmore.	Closed.
M. 17	Pons.	3·5 ×2	Pneumonia followed by pneumoc. arth.	,,
M. 32	Lt. pari. c.s.o.	3·5	Severe quinsy 5 months before.	P. pr.
M. 46	Lt. fr. c.s.o.	5	Carbuncles 14 months before.	,,
M. 14	Cereb.	4·5	Doubtful history of aural discharge.	Closed.
M. 19	Lt. temp.-sph.	4	Earache 4 months previously.	Head alone examined.
M. 48	,,	Large.	—	P. pr.
M. 45	Rt. occip. c.s.o.	4 ×3 ×5	—	,,
F. 7/12	Rt. pari. c.s.o.	3 ×2	—	,,
F. 1½	Rt. fr. c.s.o.	6 ×5 ×5	—	Closed.
M. 50	Rt. occip. c.s.o.	6	—	P. p.
F. 14	Lt. fr. c.s.o.	4	—	Closed.
F. 17	Rt. occip. c.s.o.	2	—	P. pr.*
M. 17	Rt. fr. c.s.o.	7	—	Head alone examined.
F. 22	Lt. fr. c.s.o.	6	—	Closed.
M. 41	Lt. pari. c.s.o.	6·5 × 4 ×3.	—	P. p.

* Also patent interventricular septum.

Pari.=parietal; P. p.=patent to pencil; P. pr.=patent to probe.

PYOCEPHALUS COMPLICATING BRAIN ABSCESS.

Pyocephalus was found associated with brain abscess at necropsy in 40 per cent. of the cases; *it* is to be regarded, therefore, as a frequent complication. It appeared to have been established in one of two ways:—

(1) The abscess had extended and ultimately had ruptured into one of the ventricles of the brain, invariably into the lateral ventricle on the corresponding side. This extension of the infection, as

already mentioned, was marked in its early stages by the presence of a finger-like area of encephalitis projecting from the abscess towards the ventricle; in the later stages this area became a diverticulum of the main abscess; eventually this reached the ependyma of the ventricle, and ruptured into the ventricle. The rupture was marked clinically by the sudden introduction of grave symptoms.

(2) The other method by which the infection had spread into the ventricles setting up gross pyocephalus occurred with equal frequency, being found in 50 per cent. of the cases which demonstrated this complication at necropsy. Here the initial step in the process appeared to be the occurrence of leptomeningitis; the infection presumably had reached the ventricles from the subarachnoid space via the foramina in the roof of the fourth ventricle. Clinically this was not identified with the occurrence of catastrophic symptoms as was the case in the previous mode of spread, the process being a gradual one.

THE ASSOCIATION OF MENINGITIS WITH BRAIN ABSCESS.

The association of leptomeningitis with brain abscess was found to be a common one. In its distribution it was either generalised, or localised to a small area over the site of the abscess. In one form or another it was found to be present in 67 per cent. of the cases of brain abscess discussed in this paper. In 70 per cent. of these the purulent leptomeningitis was general; in the remainder it was localised to the surface of the abscess.

OTHER CONDITIONS ASSOCIATED WITH BRAIN ABSCESS.

The relationship between thrombosis of the cerebral sinuses and brain abscess has already been considered. Septicæmia as indicated by hyperplasia of the pulp of the spleen with or without engorgement was present in 30 per cent. of all cases where a full necropsy was conducted. Parenchymatous degeneration of the liver, kidneys, and myocardium was also present in varying degree of severity. Internal and external hydrocephalus with flattening of the cerebral convolutions were commonly observed, and post-operative hernia cerebri was sometimes present.

I am greatly indebted to Prof. Hubert M. Turnbull for his permission to use the records of the Bernhard Baron Institute of Pathology, and for his valuable criticism and help.

ETHER AS A CAUSE OF DEATH AFTER PROSTATE OPERATIONS.

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I HAVE long felt that the mortality-rate in prostate operations is far too high. For many years I have noticed that patients for whom the prognosis seemed favourable have died from uræmic conditions some five or six days after operation, although the pre-operative blood-urea has been within what are called normal limits.

Statistical evidence is ample to demonstrate these facts. In a hospital report for two separate years the death-rate is shown to be over 50 per cent. in two-stage prostatectomies, and almost 50 per cent. in the one-stage. In all operations undertaken for bladder conditions connected with the prostate, the death-rate is over 50 per cent.

It is well known that the effect of an ether anæsthetic on renal function is considerable. As far back as 1899 and 1900 R. C. Kemp and W. H. Thompson in America and B. W. Buxton and A. G. Levy, in this country, were putting forward theories to account for the albuminuria after ether anæsthesia. In 1927 Haines and Milliken[1] examined between 60 and 70 cases, and showed that when ether was administered albumin was present in the post-operative urine. It appears, therefore, that ether produces transient renal damage, probably slight cloudy swelling. Florence Stephen[2] has similarly reported albuminuria in all of a series of cases examined after ether anæsthesia, and has suggested that the anæsthetic causes changes in the renal cells.

In the accompanying Table I give urea estimations before and after anæsthesia, and 24 hours and 48 hours later. It should be noted that no change takes place in the urea during the time of anæsthesia, but the Table suggests two things: (1) the higher the urea content of the patient, the greater the rise in the day or two following the operation; (2) there was no change in the blood-urea on the days following administration of gas and oxygen (one case).

Comparison of Urea Estimation in Relation to Anæsthesia.

Operation.	Method.	Amount of ether used.	Time of anæsthesia.	Urea mg. per 100 c.cm.		
				Before and after.	24 hours after.	48 hours after.
		oz.	mins.			
Gastro-ent.	Open ether.	20	60	38–38	N.	44
"	"	16	45	N.–41	45	61
Gastro-ent.*	Gas/oxy/ether endotracheal.	3½	60	49–49	78	72
Appendicec. and cæcopexy	Open ether.	7	35	33–N.	35	28
Goitre removal.	Gas/oxy/ether endotracheal.	2	55	20–20	N.	23
Appendicec.	Gas/oxy/ether face mask.	1	20	N.–26	33	30
"	"	4	45	18–20	21	24
"	Gas and oxy.	Nil.	25	33–35	35	35
Radium insertion.	"	"	20	N.–20	35	30
Appendicec.	Gas/oxy/ether face mask.	2	25	25–25	34	38

* This case was found to have hyaline casts in the urine, and a blood-urea of 62 mg. per 100 c.cm. ten days after operation. Probably a patient with some pre-operative renal damage.

N.= No estimation. Gastro-ent. = gastro-enterostomy. Appendicec. = appendicectomy.

As an illustration of what happens in prostate cases I mention a patient who had a one-stage prostatectomy under gas and oxygen anæsthesia, with the addition of 3 oz. of ether, the time taken being three-quarters of an hour. The blood-urea before operation was 38 mg. per 100 c.cm., and it was estimated daily for four days, and then two days later. The following are the figures:—

41 mg. per 100 c.cm.	first	day after operation.
96 mg.	" "	second	"	"
138 mg.	" "	third	"	"
127 mg.	" "	fourth	"	"
96 mg. per 100 c.cm.	sixth	"	"

It is quite true that this patient did not suffer clinically from untoward symptoms. He was a strong, healthy man, aged 65 years, but it is manifest that the condition of the blood-urea following the operation was important, and under less favourable conditions might have been disastrous. It will be noticed, however, that the blood-urea before operation was within what are looked upon as normal limits.

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[1] Haines, W. H., and Milliken, L.: Jour. Urol., 1927, xvii., 147.

[2] Stephen, F.: Brit. Jour. Anæsth., 1929, vi., 109.

The conclusions I draw from the foregoing biochemical investigation are as follows: 1. The higher limits of what is called normal blood-urea are abnormal. Cases where it is high will develop a far higher blood-urea after anæsthesia. This applies to all operations. 2. The cause of the increase is the effect of ether on the renal cells. 3. In any case of enlarged prostate, with a blood-urea approaching 40 mg., the operation should be performed in two stages. 4. When there is an abnormal blood-urea and any renal damage, gas and oxygen anæsthesia only should be used.

PROTECTIVE ACTION OF GRANULATION TISSUE AGAINST THE ABSORPTION OF TOXINS.

EXPERIMENTS WITH TETANUS TOXIN AND COBRA VENOM.

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It has long been known that granulation tissue exerts a protective action against the penetration of pyogenic organisms from its surface into the deeper tissues. Thus Billroth (1865, 1871) demonstrated that in dogs the repeated application to a granulating wound of dressings soaked in putrid pus was without ill-effect either locally or on the animals' general condition; whereas when similar material was injected into the subcutaneous tissue inflammation, fever, or even pyæmia resulted. Later, Afanassieff (1896) came to the conclusion, from his experiments on susceptible animals, that various virulent pathogenic organisms such as *Bacillus anthracis* and *Vibrio metchnikovi* were unable to cause infection when placed on granulating surfaces. Noetzel (1898) confirmed these results with anthrax bacilli in guinea-pigs, rabbits, and sheep; the critical period at which the surface was protected was found to be the fifth or sixth day after the production of the wound. Noetzel failed to find that, as stated by Afanassieff, immunity resulted from such implantation of organisms on granulation tissue. Thus, in the case of a sheep which had repeatedly tolerated the application of anthrax bacilli to a granulating surface, Noetzel excised the wound two days after the last inoculation, and death from anthrax occurred 48 hours after the operation; the freshly exposed tissues had evidently become infected from persisting bacilli or their spores. This protective action of granulation tissue against infection with pathogenic organisms contrasts with the ready absorption of crystalline substances, such as potassium iodide (Demarquay, 1869) or pilocarpine (Hack, 1880), when applied as solutions to surfaces covered with granulation tissue.

TETANUS TOXIN.

In the case of tetanus toxin, however, Noetzel (1898) showed that granulation tissue was apparently an effective barrier, since the usual symptoms failed to develop when toxic fluid cultures were introduced into five- to eight-day wounds in sheep, and the animals remained well. In view of the great importance of this observation the work has been repeated.* Tetanus toxin was used and rats were selected, since, owing to their high susceptibility to this poison, a ready indication could be obtained as to whether or not absorption had occurred. Under ether anæsthesia an incised wound about half an inch long was made in the skin of the gluteal region after the hair had been clipped and the patch cleansed. The muscle-fibres were then separated by inserting the blades of sharp-pointed scissors until a small cavity was made in the muscle; into this cavity a small plug of cotton-wool was inserted, and the skin wound was sealed with collodion. After a varying period in different animals the wound was reopened and the cotton-wool plug removed, the greatest care being taken to avoid causing any bleeding. A platinum loopful of the dry powdered toxin was then placed in the wound cavity, a fresh plug of cotton-wool inserted, and the wound sealed as before with collodion. It was found that, by making the platinum loop sufficiently small, the quantity of powder lifted was fairly constant, and by actual weighing represented about 20 times the minimum lethal dose for the size of rat used. While the usual aseptic precautions were observed, the attainment of complete asepsis in the wounds was not attempted.

TABLE I.

Days (a).—Interval in days between infliction of wound and introduction of toxin.

No. of animal.	Days (*a*).	Result.	No. of animal.	Days (*a*).	Result.
1	0	General tetanus.*	14	5	Delayed local spasms: died on 16th day.
2	0		15	5	Well.
3	0		16	5	"
4	0		17	5	"
5	0		18	5	"
6	0		19	5	"
7	0		20	5	Well.†
8	4	Local spasms.*	21	6	Well.
9	4	Local spasms—died.	22	7	"
10	4	Local spasms.	23	7	"
11	4	Well.	24	9	"
12	4	"	25	9	"
13	6	Delayed local spasms: died on 8th day.	26	9	"

* Indicates killed with an overdose of chloroform.

† Wound reopened five days after inoculation, with abrasion of granulations and bleeding: local spasms.*

Note.—All those animals recorded as "well" were observed over a period of several weeks, with the exception of rat No. 20.

The table shows in detail the results obtained, and these may be summarised as follows:—

(*a*) Seven rats were inoculated with the toxin immediately *after the infliction* of the wound, and all developed acute general tetanus within 36 to 48 hours, and were killed with chloroform.

(*b*) Five rats were inoculated with the toxin four days after the infliction of the wound, and of these two remained completely well and three developed local spasms in the wounded leg and were killed.

(*c*) Eight rats were inoculated with the toxin five days after the infliction of the wound, and of these six remained well and two developed local spasms in the wounded leg five and six days *after inoculation, and died on the eighth* and sixteenth days after inoculation respectively.

(*d*) Six rats were inoculated with the toxin six to nine days after infliction of the wound, and all remained well.

Briefly, of 12 rats inoculated *before the fifth day only* two failed to develop tetanus; while of 14 rats inoculated on or after the fifth day 12 remained well, and the remaining two developed local tetanus only.

From a study of these results it appears that when the interval between the infliction of the wound and the insertion of the toxin exceeded five days the animals were protected from the action of the toxin. When the interval was four or five days a proportion of the animals (8 out of 13) remained well, while the remainder (5 out of 13) developed spasms localised to the wounded leg, and seemed otherwise healthy.

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* I am indebted to Dr. R. A. O'Brien, of the Wellcome Physiological Research Laboratories, for a supply of tetanus toxin in solid form, obtained by precipitating the fluid toxin with ammonium sulphate.

The appearance of spasms localised to the neighbourhood of a wound has been interpreted clinically as evidence of either a relatively slight infection or the presence of a certain degree of immunity, as in cases treated with antitetanic serum. It seems reasonable to conclude that in a healing wound some process has taken place which, after the fifth day, affords protection from the action of the toxin. On or about the fifth day the process is apparently incomplete in that a partial protection only is afforded. As regards the nature of the protection, Pettersson (1911) has shown that, of the cells commonly present in young granulation tissue, the leucocytes, macrophages, and lymphocytes of guinea-pigs, rabbits, and fowls possess little or no power of fixing tetanus toxin. In this connexion the result of a further experiment on rat No. 20 is important. This rat was inoculated with the toxin on the fifth day without apparent ill-effect, but five days after the inoculation the wound was reopened and a fresh plug of wool inserted. In the process some bleeding occurred from the granulations, and within 48 hours the animal developed local spasms in the wounded leg. Obviously sufficient toxin was still present in the wound cavity to cause symptoms of tetanus when the conditions were suitable for its absorption. The evidence, therefore, does not appear to support the view that there is any marked degree of fixation or destruction of the toxin locally by the granulation tissue; it would rather appear that the toxin persists in situ without undergoing absorption. Since various crystalloids are readily absorbed from granulating surfaces, the tetanus toxin may fail to be absorbed into the deeper tissues and the circulation on account of its physical characters as a colloid which is quite inert locally. The protective action would seem to be accounted for by this non-absorption, together with the failure of access by the toxin to lymphatics or nerve-fibres, which are absent from granulation tissue.

COBRA VENOM.

A similar series of experiments was also carried out with cobra venom which, like tetanus toxin, produces poisonous effects chiefly in virtue of containing a neurotoxin. The venom was in the form of fine particles, and the administration of a constant dose was not feasible. The average quantity employed, however, was much in excess of the minimum lethal dose. Twenty-five rats in all were employed, and 20 died within 24 hours of inoculation, the interval between the infliction of the wound and the inoculation varying from five to ten days. Five rats remained well, the interval in their case being six or seven days. The wounds of those rats that died showed no characteristic changes compared with the wounds of those that survived. In the case of the cobra venom, therefore, the protective action of granulation tissue has not been established.

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CLINICAL AND LABORATORY NOTES

ALARMING RECTAL HÆMORRHAGE IN UNSUSPECTED TYPHOID.

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A PATIENT is seized with abdominal pain accompanied by considerable if not alarming bright red rectal hæmorrhage—thrice in my experience this syndrome has proved the only manifestation of typhoid. It is to these cases and to diagnostic problems arising therefrom that I wish to draw attention.

CASE 1.—A previously healthy woman of 38 complained of sudden abdominal pain and nausea 48 hours before admission. Early in this attack she passed a motion containing much bright red blood. Dull pain continued up to the time she entered hospital, when another stool consisting entirely of blood, mostly bright red but containing some clot, was evacuated. I was asked to see her regarding the possibility of the symptoms being due to an intussusception. On examination she appeared pale, the temperature was normal, and the pulse-rate 98. The only physical sign on abdominal examination was deep tenderness in the right iliac fossa. On passing a finger into the rectum I noticed that it felt hot. Remembering occasions on which this sign had proved of value in the diagnosis of obscure cases of typhoid, a specimen of blood was sent for Widal's reaction. It was returned "strongly positive." With appropriate medical treatment the patient recovered.

CASE 2.—Late one night I was summoned urgently to see a boy of 14 who was stated to be bleeding per rectum "like a tap." His history was that he had had abdominal pain for ten days. For the past 24 hours the stools had been frequent, and latterly had consisted entirely of bright red blood. The pulse-rate was 100 and the temperature normal, and he complained of pain in the region of the descending colon. The abdomen was somewhat distended, but on palpation there were no other physical signs. The rectum was full of red blood, and a considerable number of dark clots were passed after the rectal examination. No rash could be seen and the tourniquet test for purpura was negative. The notes state: "? typhoid, ? intussusception." Widal's reaction was requested. On the following morning I learned that he had had a good night and was somewhat better. The Widal reaction was returned as "negative T.A.B." At 3 P.M. I was again called. The pulse-rate had now risen to 120 and rectal hæmorrhage had recommenced. The nurse stated he had passed nearly 1½ pints of pure blood during the past four hours. He was blanched and obviously in imminent danger from loss of blood. As soon as possible I transfused the patient with a pint of blood from his father, whose blood was compatible. Improvement was striking and immediate. He passed a good night, but early the following morning complained of considerable spasmodic lower abdominal pain. Some blood-clot was passed per rectum, but apparently there was no fresh hæmorrhage. As the abdomen was still distended I felt that laparotomy should no longer be delayed. Under spinal anæsthesia lower laparotomy was performed. No pathological condition was found, but the large intestine appeared heavy and dark with blood. The abdomen was closed and he was returned to bed. For five days he continued to improve. No fresh bleeding had occurred since the transfusion, and on the sixth day he passed a normal stool. On the eighth day his temperature, which had previously been normal or subnormal, began to rise, and he looked toxic. On the tenth day diarrhœa began and the temperature rose to 101°. The Widal reaction was repeated, and was returned: "typhosus 1—640, positive +++; para 'A'—negative; para 'B'—positive 1—20." He passed into a delirious state and d on the thirteenth day from the time of the first ervation.

ASE 3.—A clerk, aged 30, was sent to hospital as a case intestinal obstruction. He stated that five days pre- usly he had been seized with acute abdominal pain and n afterwards had passed half a pint of bright red blood. the following day he had vomited twice and again ssed blood. The pain and the bleeding had continued d the stools had been largely composed of blood. The tient did not look ill. His temperature was 99·6° and pulse-rate 98. On examining the abdomen it was at ce evident that there was considerable distension. The tum was empty and the examining finger showed a little od. An enema was given and was returned blood- ined without any fæces. I passed a sigmoidoscope and w some blood and blood-clot in the sigmoid, but other- se the examination was negative. He was returned to d and instructions were given to measure the girth of e abdomen every three hours, and also to report imme- ately any untoward symptoms. By the following morning e tape measure showed that the abdomen had enlarged ore than one inch, and he complained of severe spasmodic ntral abdominal pain. An enema produced the same sult as before. A diagnosis of intussusception probably e to an inverted Meckel's diverticulum was made. On ening the abdomen, by a curious coincidence, the first ing which presented was a Meckel's diverticulum over o feet in length. From its apex there was a cord running the umbilicus. The cord and the diverticulum were cised, but as they were obviously not causing obstruction rther examination was made. The cæcum and colon ere systematically examined. On coming to the splenic exure a change was seen and the whole of the large gut om this point onwards was thickened, blood-red, and hot. he abdomen was closed, and blood taken for a Widal. he report was "Widal's reaction strongly positive." As he patient had never received any typhoid inoculations here was now no doubt that the symptoms were due to phoid. Recovery followed.

DIAGNOSTIC PROBLEMS.

In a case of more or less sudden abdominal pain ccompanied by considerable rectal hæmorrhage he following possibilities are to be considered. It s assumed that a rectal growth will be eliminated by he clinical examination.

1. *Typhoid fever.*

2. *Intussusception.*—The amount of blood passed n cases of intussusception in adult life may be onsiderable, and differential diagnosis becomes really difficult. If the stool is closely examined, mucus will surely be discovered. In five out of six examples of proved intussusception occurring in adolescent or adult life[1] which I have treated, a lump has been easily felt in the abdomen at the clinical examination. In the sixth case a lump could not be felt, but sigmoidoscopy was rewarded by a unique view of the apex of an intussusception with a carcinoma upon it.

3. *Purpura with abdominal symptoms.*—The presence of purpuric spots may be noted. In doubtful cases the tourniquet test should be applied. I have discussed elsewhere the problem of purpura as an acute abdominal emergency.[2]

4. *A bleeding duodenal ulcer.*—It is possible for hæmorrhage to be the first intimation of duodenal ulceration. In this instance blood passed per rectum is unquestionably dark—so dark, in fact, that it is usually described as "tarry." On this account a bleeding duodenal ulcer hardly ever enters the clinical picture, but in the problem before us it is necessary to exclude it.

I have presented this subject as I have seen it. No doubt workers in other fields are confronted with abdominal pain associated with violent rectal hæmorrhage from other causes. For instance, it seems probable that bilharzia might produce this syndrome.

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[1] Bailey, Hamilton: Birm. Med. Rev., 1928, iii., 287.

[2] Bailey: Brit. Jour. Surg., 1930, xviii., 234.

AVERTIN NARCOSIS IN UNUSUAL CIRCUMSTANCES.

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The following case is of interest from two points of view: (1) it illustrates circumstances in which avertin narcosis may be the only practical means of making the performance of an emergency operation possible; (2) it suggests that avertin may be a useful method of treatment in one of the conditions which was present—namely, delirium tremens.

A man, aged 59, had been suffering for some time from an inoperable carcinoma of the larynx. Tracheotomy had been advised, but had been refused by the patient's wife until it should become necessary. On April 4th respiratory obstruction came on rapidly, and by the evening the need for tracheotomy was urgent. Unfortunately, on this very day the patient developed delirium tremens.

I first saw the patient at 9 P.M.; he was cyanosed, and the cyanosis was increasing. The respiration was markedly stertorous, and all the accessory muscles of respiration were strongly in action. The patient was not violent, but extremely restless, having to be held in bed, and quite inaccessible to reason or argument; this was in spite of morphia gr. 1 which had been given in the preceding six hours.

A dose of avertin equal to 0·1 g. per kg. of body-weight was rapidly run into the rectum, and most of it was retained. In 15 minutes the patient became quiet and lost consciousness, and was transferred to the theatre. When the first incision in the neck was made he was breathing rather more quietly than before, but with less effort; cyanosis was still increasing, and was by now severe. There was no movement when the incision was made, and no anæsthetic was given. Before the tracheotomy was completed, however, respiration ceased, and, in spite of administration of CO_2 and oxygen through the opening in the trachea, did not begin again, and the patient died.

Death was due to suffocation, which the avertin may or may not have accelerated, but at the same time there can be little doubt that a few hours earlier the operation would have been successful. Circumstances, however, made this impossible, and small regret could be felt since the result was euthanasia for a patient whose immediate future would otherwise have been far from comfortable.

The only alternative to avertin in this case would, so far as I can see, have been an attempt to perform the operation under local anæsthesia while holding the patient still by violence. Any kind of inhalation anæsthetic was impracticable, and the intravenous administration of nembutal or one of the barbitones would probably have been impossible.

The prompt and efficient action of avertin upon a patient with delirium tremens, in which most narcotics and hypnotics are so notoriously ineffective, and who had already had morphia gr. 1 without any considerable quietening effect, suggests that where the administration is possible avertin might be the drug of choice to give in troublesome cases of this condition. The effect would presumably last for some hours, and the dose could be repeated without any danger so far as present experience goes.

I am indebted to the kindness of Mr. Eric Steeler for permission to publish this case.

Fewer Road Accidents.—At the annual meeting of the Victoria Hospital, Lewes, it was stated that during the last few months the average number of road accidents treated had fallen from 28 or 30 a month to six or seven. The diminution is attributed to the working of the new Road Act.

MEDICAL SOCIETIES

EDINBURGH OBSTETRICAL SOCIETY.

AT a meeting of this society on May 13th Dr. H. S. DAVIDSON, the President, took the chair, and a paper on

Uterine Prolapse

was read by Miss GERTRUDE HERZFELD and Miss MARGARET TOD, embracing an investigation into 227 cases of prolapse operated on between 1922 and 1929. Of the 227 cases, 132 were traced for periods varying from one to seven years. As regards symptoms, the complaint of "something coming down" was not universal; a woman with cystocele, rectocele, and cervix at the vaginal orifice might have little local discomfort, but reported for discharge or backache. Frequency of micturition was one of the most constant symptoms in all varieties of prolapse and was present before operation in 70 per cent. of the 227 cases, while every case of total prolapse had incontinence. Vaginal discharge was complained of in every case where a lacerated cervix was found, and 30 out of 34 such cases also complained of backache. On the other hand, only 10 out of 39 complete prolapses made this complaint. Complications after operation were associated with sepsis and consisted either of secondary hæmorrhage which occasionally occurred after amputation of the cervix, or, still more rarely, of sloughing of the wound.

Table Analysis of Results of Operation.

Condition found at operation.	Totals.	Cured, no symptoms.	Uterus, &c., in good position, but urinary symptoms present.	Prolapse recurred.	No symptoms. Slight cystocele found on examination.	Post-operative pregnancies.	
						Norm.	Instru.
Cystocele only ..	11	7	3	1	0	0	0
Rectocele only ..	6	4	2	0	0	1	2
Cystocele and rectocele ..	56	47	8	0	1	3	0
Cystocele with hypertrophy of cervix.. ..	7	5	2	0	0	1	1
Cystocele and rectocele with hyper. of cervix	13	12	1	0	0	1	0
Cystocele and rectocele with lac. cervix ..	19	17	2	0	0	2	0
Complete prolapse	20	17	0	1	2	0	0
Total ..	132	109	18	2	3	8	3

The technique of operation evolved by Donald and Fothergill of Manchester was almost always followed in all cases. The accompanying Table shows that 127 out of 132 patients (96 per cent.) were completely cured, though 18 patients had a slight complaint of frequency of micturition. In all these the urine was acid, and in the majority a slight *Bacillus coli* infection was noted. Two cases, done early in the series, showed partial failure with recurrence.

The conclusions reached were as follows: (1) Surgical treatment of uterine prolapse is a safe and satisfactory method of treatment. (2) Abdominal surgery is never required in this condition. (3) The operation results in a feeling of well-being often not experienced by the patients for many year previously. (4) Pessary treatment, while palliativ as regards symptoms, should be used only in case where operation is out of the question, or in ver young women.

Heart Disease and Pregnancy.

DR. A. RAE GILCHRIST read a paper in which he sai that four years' experience of cardiac cases in th antenatal department and wards of the Royal Maternit Hospital, Edinburgh, had led to the conclusion tha no more accurate method of assessing the ability o these cardiac women to go successfully to term wa to be obtained than by grading them accordin to the functional efficiency of the heart. The type o valvular disease and the ætiology and degree o the cardiac hypertrophy were in themselves of almost no help in prognosis. The actual structural change in the heart mattered little. The all-important factor was the functional efficiency of the heart muscle. This could readily be assessed by noting the response of the patient to her everyday activities. The classification of cardiac disease outlined by the New York Heart Association had proved of great assistance. At the time of the first examination an attempt ought to be made to classify the patient according to one of the following groups:—

Group 1.—Those, who though suffering from organic heart disease, were able to perform their habitual physical activities without any unusual distress, fatigue, or dyspnœa.

Group 2A.—Those who were able to perform their usual activities, but had some slight discomfort in so doing. They had a slight limitation of physical activity, which showed itself by shortness of breath on climbing stairs, on walking uphill, or after performing household duties.

Group 2B.—Those who had a definite limitation of physical activity. They were unable to perform their usual duties without resting at intervals. Several halts were necessary in climbing a flight of stairs. They had given up attempting the more strenuous household duties and at night the ankles might be a little swollen.

Group 3.—Those few whose cardiac reserve was minimal. They were unable to carry on any physical activity without discomfort. They could at the most only walk a few yards and that with difficulty. They had a greater or less degree of congestive heart failure even at rest in bed.

Those in Group 1 gave rise to little or no difficulty. In Group 2A also pregnancy and labour caused but little anxiety, though if the second stage was prolonged the timely use of forceps was indicated. Many patients who came into Group 2B before the sixth month would require Cæsarean section at or about term. Others who developed such a grade of failure in the later months and who responded satisfactorily to treatment would be able to deliver themselves spontaneously and without risk. Women in Group 3 were almost as certain to die if they went into labour spontaneously, or if any obstetrical interference was attempted before circulatory conditions were adequately treated. Heart failure of this degree in the first few months of pregnancy was probably unrelated to the demands of the fœtus. Hysterotomy should be performed as soon as the woman was judged fit enough. In the later months this degree of heart failure could be avoided by adequate antenatal care directed to improving circulatory efficiency. If a case was seen with this degree of failure with labour imminent energetic medical measures must be instituted at once. It was an axiom that no women should be exposed to the additional strain of active obstetrical interference before every endeavour had been made to improve the circulation. Left alone they might deliver themselves successfully and often prematurely; interfered with, they were almost certain to die, if not at the time of intervention then in the early days of the puerperium. Happily such cases were not very common.

In 95 cardiac cases carefully followed through pregnancy, labour, and the puerperium, 92 per cent. of the patients survived pregnancy. The percentage of women who delivered themselves successfully at or about term was roughly as follows: Group 1, 85 per cent.; Group 2A, 77 per cent.; Group 2B, 56 per cent.; and Group 3, 18 per cent. There were no Cæsarean operations in Group 1. In Group 2A these amounted to nearly 8 per cent., but in the light of present experience had probably been unnecessary. In Group 2B the Cæsarean sections were 38 per cent. and in Group 3, 55 per cent. Many of the cases were done under spinal anæsthesia with admirable results, but chloroform combined with oxygen seemed safe in skilled hands. Ether was doubly irritating to lungs a trifle congested, and gas, if it caused any cyanosis, embarrassed the heart by anoxæmia. The anæsthetist was more important than the anæsthetic.

ROYAL SOCIETY OF MEDICINE.

SECTION OF LARYNGOLOGY.

At the summer meeting of this section on June 5th Mr. **Frank Rose**, the President, took the chair, and Dr. A. **Brown Kelly** (Glasgow) read a paper by himself and Dr. Leonard Findlay on

Congenital Shortening of the Œsophagus and the Thoracic Stomach resulting therefrom.

In œsophagoscopy of nine cases having congenital stenosis of the œsophagus, no hindrance was encountered at the entrance to the œsophagus, but sometimes the lumen contained a good deal of cloudy fluid, and in almost every case it was much dilated. At a depth which varied in different patients the lumen quickly diminished to a small opening, which was found to be the upper end of the stenosis. In most of the cases examined this region showed rhythmical movements—i.e., it opened with inspiration and closed with expiration. The endoscope could easily be passed through the stenosed part, whose length varied between 0·5 and 2 cm. On emerging from the stenosis, gastric mucosa was encountered. These conditions found at the stenosis were just those present in the diaphragmatic part of a normal œsophagus. The so-called congenital stenosis was really the cardiac canal situated opposite the seventh instead of the ninth or tenth thoracic vertebra. One could apply the terms epicardia and cardia respectively to the regions at the upper and lower end of the stenosis. In several cases, to decide where the œsophageal joined the gastric mucous membrane, a small piece of the lining membrane below the apparent junction was removed, and was found to consist entirely of gastric mucosa. When trying to locate the upper end of the stomach, the œsophagoscope was introduced until it reached the gastric mucosa, a fragment was removed if necessary, and a radiogram was taken with the tube in situ. Having located the cardia and marked it on a tracing of the radiogram the distance was measured to the hiatus, and the result gave the displacement of the cardia, and, presumably, the amount of shortening of the œsophagus. Calculations so made gave results in seven cases which varied from 2 to 6 cm. A few autopsies had shown that a congenitally short œsophagus was occasionally met with.

Dr. **Leonard Findlay**, speaking on the clinical aspect, said that in all the nine cases vomiting started early, not of spasmodic character, but persisting throughout the meal. When such a symptom was reported, a soft stomach-tube was passed and an obstruction met with. At first he thought the condition might either be ballooning of the lower part of the gullet or dilatation of the œsophagus itself. Radiography was not sufficient to demonstrate it; examination must be made during the act of swallowing, and the patient must be on an inclined plane to encourage delay of the food along the gullet. In the child the position of the junction of the stomach and œsophageal mucous membrane varied considerably—namely, from 4 mm. above the hiatus to 10 mm. below it. It was wrong to think of the œsophagus as a comparatively narrow tube opening into the large sac of the stomach; the two were a continuous whole, and during swallowing the œsophagus widened out and conformed more with the stomach to allow of the passage of food.

Mr. **Harold Barwell** said it was as yet early to realise the various implications in this new conception. If the intrathoracic cardia was a common condition, he wondered in what way it was connected with congenital stenosis.

Dr. **Brown Kelly** said that three years was not a long enough period to enable one to know what happened to these patients at a later period of life. Possibly as the children became older some change took place which enabled the cardia to descend; there was no pathological evidence that the condition was permanent.

Autodilatation of the Œsophagus.

Prof. **Georges Portmann** (Bordeaux) read a paper on the Treatment of Cicatricial Stenosis of Œsophagus by Autodilatation. The principle underlying this treatment was that the patient carried out the dilatation without knowing it, the instrument progressing by peristaltic movements of the walls of the œsophagus. Confronted with a case of cicatricial stenosis, Prof. Portmann first did a gastrostomy under local anæsthesia. When the wound had healed, a filiform bougie was pushed in from the top to the bottom of the stricture and, controlled by the œsophagoscope, as far as the stomach. The extremity of the bougie was taken out through the opening of the gastrostomy after the patient had fasted 12 hours. At the mouth of the gastrostomy he introduced a No. 22 Nelaton probe, whose eyes enabled the stomach to be washed out. After 400 c.cm. of boiled water had been put in the stomach the cystoscope was introduced and the postero-internal wall of the stomach was explored from various angles. A thick silk thread was then tied to the end of the bougie and it was withdrawn. To this "endless" thread, passing from the mouth to the gastrostomy opening, dilating olives could be attached, the smallest being devised to enter the stricture first. At first he used bone olives, but found that they became gradually digested by the patient, therefore he was now using ones made of a silver alloy. When the olives had passed the stricture they fell into the stomach, the patient feeling well all the time. When the olives were in the stomach they were withdrawn through the gastrostomy opening. Three to six days were required for the passage of the olives through

MEDICAL SOCIETIES

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39 complete prolapses made this comp- ..lves heard. One
plications after operation were ..ube for 70 years and
sepsis and consisted either of se- ..ion catarrh did occur he
which occasionally occurred common mistake was to divide
cervix, or, still more r- ..e trachea, or even the cricoid, so
wound. ..e cannula into the narrower and

Table Analy- ..glottic larynx.

..s **Dundas-Grant** had a good word for
..ler tube; it was easy to insert and it was
..cable, but it also came out too easily. He
..ued it with a quarter-circle tube; it improved
.. Parker to put a sliding collar on it. In many
Conditic..ays the Durham tube was ideal, but it should be
at or bent at more than a right angle.

Mr. **Herbert Tilley** described Sir StClair's communication as one of the most valuable ever presented to the section. Those with long experience recognised the pathos of cases where tracheotomy for diphtheria in children was done too high, perhaps even through the cricoid cartilage. The resultant permanent stenosis was difficult to cure.

Mr. **Ritchie Rodger** spoke of a patient of his who 11 years ago came because he had stenosis from tuberculous laryngitis and perichondritis, and whose condition he regarded as unsatisfactory so long as he continued to wear his tube. The patient saw Sir StClair Thomson and was assured that no ill-effects need follow the permanent wearing of the tube.

Mr. **Walter Howarth** had been struck by the contentment shown by the patients brought forward. Indeed he wondered whether surgical attempts to correct stenosis were worth while, seeing how comfortable these patients were. A type of case in which surgery was difficult was that in which stenosis followed the falling-in of the cricoid cartilage when tracheotomy had been done too high.

Prof. **Portmann** said he had found, in many men with stenosis following war wounds, that it was well to do tracheostomy, then clear away the cicatricial tissue, and after the stenotic process had ceased, to do a plastic operation. This was preferable to the patient always wearing a tube.

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Heart Disease and Pregnancy.

Dr. A. **Rae Gilchrist** read a paper in which he said that four years' experience of cardiac cases in the antenatal department and wards of the Royal Maternity Hospital, Edinburgh, had led to the conclusion that no more accurate method of assessing the ability o-
these cardiac women to go successfully to ter-
to be obtained than by grading them-
to the functional efficiency of the ! **STUDY OF DISEA**
valvular disease and the- -r **CHILDREN.**
the cardiac hypertr- ..ing of this section on June 2-
no help in pr..gh **Thursfield**, the President, in the
in the ..f. A. **Calmette** (Paris) read a paper on
factor-

BCG Immunisation of Infants.

He pointed out that most people we..
taneously vaccinated against tuberculosis by ..
accidental "paucibacillary" contaminations in
youth. To protect man from tuberculosis ..
of immunity, which sensitised against tuber-
failed to cause progressive lesions, should be ..
artificially. Only living bacilli would i..
effectively, but spontaneously attenuated ..
could not be used, because they tended to ..
their virulence as spontaneously as they had ..
Experience had shown that avian and para-..
bacilli could not be used to vaccinate ma..
Prof. Calmette and Mr. C. Guérin had therefore
working for nearly 30 years at the pro..
creating a strain of hereditarily and fixedly a..
tubercle bacilli, comparable with the anthrax
cines of Pasteur. The strain known as BCG
been obtained by 230 passages on a highly ..
lipoid-containing culture medium prepared with
ox bile. This strain had never produced prog-
tuberculous lesions which could be inoculated
passage. It was absolutely harmless, but ..
injected or ingested it produced resistance ..
severe infection as effectively as did spont..
infections. The results of inoculating 317 chi..
between 1921 and 1924 had been so encouraging ..
the Pasteur Institute had decided to put BCG at ..
disposal of any laboratory or physician desiring ..
study its effects. Since 1924 research on ca..
monkeys, and apes and infant vaccination had ..
undertaken in many countries and a vast amount
experimental research work had proved the per..
innocuousness of the vaccine and its efficacy in prot-
ing against tuberculosis. The infantile death-r..
from tuberculosis—both in tuberculous and in health..
families—sank nearly to zero after vaccination a..
the general mortality markedly diminished. Vacc-
nated children resisted all kinds of infantile dise..
better than the non-vaccinated; this was probabl..
due to non-specific immunity. The Pasteur Institut..
had collected statistics from the whole country a..
had found that the general mortality among vacc-
nated infants was 6 per cent., while among th..
unvaccinated it was from 16 to 25 per cent. William
Park, of New York, had vaccinated 200 infants and
found the mortality among them in the first four years
of life was 0·9 per cent.; among 400 unvaccinated

infants born and brought up under the same conditions the mortality was 3–4 per cent. There were now more than a million vaccinated children in the world, 336,000 in France. The adoption of B C G in all countries was desirable, and it was a cheap method, since the Pasteur Institute gave the cultures free to all sanitary services. A number of workers were concerning themselves with the problem whether these bacilli could regain their virulence after repeated passage; so far no evidence for this possibility had been observed. Petroff had claimed to isolate two types of bacillus from B C G, one of them being occasionally virulent. His cultures, however, had been shown to be contaminated. A proportion of all children born were certain to meet virulent tubercle bacilli sooner or later; they might as well be given the chance of meeting avirulent bacilli, in a perfectly harmless form, before the dangerous contact occurred. England, Austria, and Portugal were the only countries in Europe not yet applying anti-tuberculosis vaccination; Prof. Calmette hoped that it would not be long before they, too, had joined the crusade.

Dr. ROBERT HUTCHISON proposed a vote of thanks. He said that Prof. Calmette had come as a missionary to this country and had set forth a case for the most serious consideration, at least, of B C G vaccination. The best vote of thanks would be the promise to introduce it in this country.

Sir WELDON DALRYMPLE CHAMPNEYS seconded the vote of thanks, saying that in this country several great names were associated with tuberculosis, but in France tuberculosis was Calmette. In France his name sufficed for a method to be accepted.

SECTION OF COMPARATIVE MEDICINE.

AT the meeting of this section on May 27th Prof. G. H. WOOLDRIDGE, the President, took the chair, and a paper on

Gland-grafting in Veterinary Practice

was read by Mr. G. P. MALE. The first recorded attempt to graft a gland was, he said, that made on a fowl by John Hunter in 1767. Some of the most important recent research in this direction had been carried out by Steinach, chiefly on rats and guinea-pigs, and this worker had succeeded in producing many intermediate changes between male and female. The results of the implantation were chiefly manifest in behaviour; a formerly sluggish and indifferent male animal would, after grafting, become vigorous, combative, and much interested in the opposite sex. Aged females, when engrafted, resumed their breeding, and the senile symptoms receded. The principle had been applied in human beings; portions of testicle from young anthropoid apes, if implanted into the human tunica vaginalis, survived for some time. Steinach produced similar results by ligation or resection of the vas deferens on one side, or later, if necessary, on both sides. The damming-back of the semen caused degeneration of the spermatic tissue and hypertrophy of the interstitial cells, with consequent increase in the output of the hormone. Brown-Séquard claimed that by subcutaneous injection of emulsions of testicular extract he was able to produce in a man aged 72 a marked accession of physical and mental powers; but such treatment must, of course, be frequently repeated.

In Mr. Male's investigations all the domestic animals on which he had operated were suitable subjects for grafting, and the gland graft took. The graft need not be implanted on the testis or ovary in order to get results; it would take effectively anywhere where it was protected from injury and where the nourishing fluids were sufficient. Aged male animals after grafting showed returned youth and vitality, and had their powers of reproduction restored. As an economic proposition, gland-grafting should be valuable to breeders. He had not tried the method in order to hasten maturity in young animals.

One case Mr. Male related was that of a Sealyham bitch, 6 years old, which after several litters failed to breed; there was absence of œstrus. Two complete ovaries were implanted, one on each side, from a year-old whippet bitch, and in a month or two there was a marked alteration in the recipient; she was temperamentally more lively, played with other dogs, and took notice of male dogs. She had a normal "heat" soon after the operation, was mated, and had three strong puppies. Another bitch had been barren two years, but after grafting produced three puppies, and had been in season many times since. To date, only one bitch which had been grafted failed to respond. Among the horses, a thorough-bred mare, 9 years old, had been barren for years although served by different sires. In 1928 she was grafted, and in 1929 produced a foal. The operation had been disappointing in cows, and in them it was only done as a last resort. For rams, boars, and bulls, however, grafting was an important economic proposition. In the case of one pedigree ram, 6 years of age, a noted sire, whose progeny were making record prices at shows, the sexual power showed great diminution, and grafting was accordingly done in 1927, the whole testicle from a young ram being grafted into each flank. One graft took well, the other became detached. In 1928 this ram produced 13 lambs, in 1929 10, in 1930 36, and in the following season 48.

In the operation itself the two most important considerations were strict asepsis and speed. In small animals a convenient site of implantation was the flank; in larger animals the centre of the neck was best. General was preferable to local anæsthesia, though the latter did not appear to interfere with the graft. He made a pocket in the subcutaneous tissue, and this obviated suturing the gland into position after the grafting.

DISCUSSION.

The PRESIDENT thought the results reported should encourage further trial. Some feared that when an animal of superior breed was receiving a gland from an inferior one, there would be deterioration as a consequence, but this did not seem to be borne out by Mr. Male's work.

Major J. B. WALKER said he would have liked to learn what was the condition of the female in each case before the grafting was done, as well as after. He gave some instances of rejuvenation in pack-horses during the war as a result of gland-grafting, and said that for this purpose he found thyroid grafts as efficacious as ovary. By careful choice of cases he believed one could promise 100 per cent. of successes.

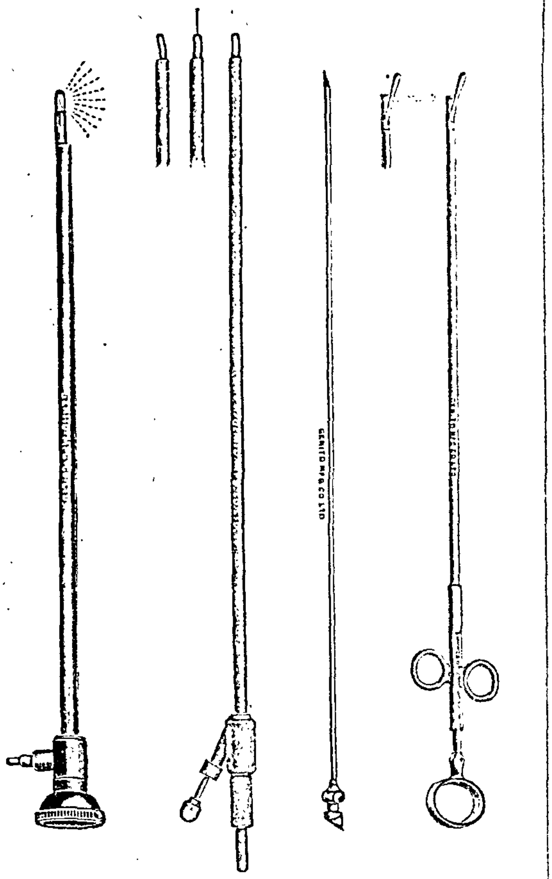
Captain S. R. DOUGLAS pointed out that good results in rejuvenation could be obtained by sterile mincing of gland, and injecting this through a trocar. Results were rapid.

Captain S. R. REYNOLDS considered that mass statistics were needed before definite conclusions were arrived at as to the wisdom of gland-grafting. Mr. Male had not mentioned why the animals referr [illegible] sterile. Careful choice of those to be de with must be made, otherwise the operation could easily get into disrepute. The value of the engrafted gland must be short-lived, necessitating a repetition of the procedure. Every horse so dealt with should be registered and its subsequent performances should be recorded.

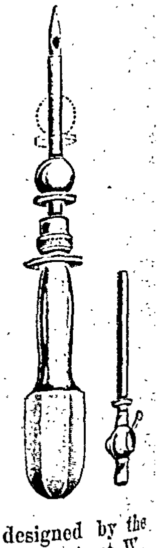
Mr. MALE, in reply, said he did not know a means of estimating the degree of ovarian deficiency in an animal. He had not had experience with thyroid grafting. One veterinarian had grafted 25 bitches, and succeeded in 22. The longest recorded life in the grafted tissue was 18 months, but perhaps the operation revived the activity of the animal's own glands. Animals were always carefully chosen.

NEW INVENTIONS

A SET FOR THORACOSCOPY AND THE DIVISION OF ADHESIONS.



THIS set of instruments for thoracoscopy and the division of adhesions is the result of the experience we have gained whilst using the Jacobæus, Davidson, and Chandler instruments and we believe it to combine the best points of these various appliances. Because of the definite increase of mobility and accuracy of working which the double puncture method gives we have adopted this method; we regard the suggestion that the extra puncture adds to the risk of sepsis as having no basis in reality, especially as more than one puncture is frequently needed by the single method on account of difficulties of approach; and we have found that emphysema is generally less marked by the double method, probably because there is less movement of the instrument and cannula. The set comprises: a boilable telescope with an angle of vision of 30°, two spare lamps and cable, a trocar, faucet, and two cannulæ of identical size, two stainless steel needles 10 in. long-fitting a 5 c.cm. record syringe with a bayonet catch, for anæsthetising the adhesions, and two endodiathermy electrodes made to our suggestion, the one straight and the other angled in order that it may be possible to work at right angles to the adhesion from any angle at which the cannula may have been introduced. These electrodes are constructed on the same principle as that used in the Chandler instrument—namely, that through a large hollow diathermy electrode a thin tungsten wire controlled at the proximal end can be pushed forward for use with the cutting current. A Maurer pattern articulated hook for investigating the dimensions of the adhesion completes the set. The telescope allows an excellent vision of the adhesion both at distance and close up and the cutting can be undertaken at the optimum viewpoint; by means of the two cannulæ of equal size the telescope may be interchanged with the electrode so that viewing or cutting can be done from either aspect, thus rendering the right angle telescope, which can be supplied as an extra, practically unnecessary. The telescope being metal there is no insulation to give way in straining to reach an adhesion. By means of the electrode described above it is possible to coagulate and cut without the complicated change over switch and two foot switches necessary when using Maurer's method. By means of the long needle through the second cannula the base of the adhesion is easily anæsthetised, cutting out the necessity for another expensive piece of apparatus. The set comprises all that is necessary for the dealing with adhesions by the two-puncture method and will be obtainable in polished mahogany case. The electrodes are used in conjunction with the special diathermy apparatus designed by the Genito-Urinary Co., Ltd., 28a, Devonshire-street, W., who are the makers of this apparatus.



A. J. SCOTT PINCHIN, M.D. Lond.
H. V. MORLOCK, M.D. Lond.

SPACE ALLOWANCE IN INFECTIOUS DISEASES HOSPITALS.—Warwickshire county council has called the attention of the Rugby rural district council to the requirement of the Ministry of Health that a space of 144 square feet must be allowed to each patient in infectious diseases hospitals. Dr. H. G. Ward, the medical officer of health, told the council that this meant that at the Rugby Joint Hospital at Harborough Magna, where there is now accommodation for 22 beds and 12 cots, there would be room only for 13 beds, and that accommodation would have to be provided for 20 additional beds. The council decided unanimously to oppose the demand, the chairman remarking that they "must fight this expenditure to the very last ditch."

REVIEWS AND NOTICES OF BOOKS

Quantitative Clinical Chemistry.

Vol. I.: Interpretations. By JOHN P. PETERS, M.D., M.A., Professor of Internal Medicine, Yale University School of Medicine; and DONALD D. VAN SLYKE, Ph.D., Sc.D., Member of the Rockefeller Institute of Medical Research. London: Baillière, Tindall and Cox. 1931. Pp. 1264. 54*s.*

Prof. Peters and Mr. Van Slyke have provided a standard work on the ground common to medicine and biochemistry of which no review can adequately express the value. Six years ago the authors began the task of compiling a handbook on quantitative clinical medicine. The close collaboration of a clinician and biochemist over such a period resulted n a most comprehensive collection of material which had outgrown the scope of a single book. They wisely decided to divide the work into two olumes. Vol. I. deals with "Interpretations," while ol. II. will be devoted to "Methods of Analysis."

The present volume—on interpretation—contains 1 chapters, of which the most informative discuss tal metabolism, non-protein nitrogen and nitrogen etabolism, uric acid, proteins of blood plasma, ine and other body fluids, calcium, chlorides, and hosphorus.

Each chapter contains a very full bibliography nd we have the authors' assurance that "all articles ave been examined personally by one or other with few unattainable exceptions which are specifically entioned; and the references even to these have en verified." This may serve as an indication of e care and diligence with which this volume has en prepared, especially when it is realised that the tal references number nearly 4000. Each chapter almost a monograph on the particular subject der consideration. Neither author is alone responsible for a *complete* chapter because the interests of the clinical chemist and the chemical clinician are so far interlocked that seldom could either leave a paragraph written by the other entirely untouched.

The physiological rôle, distribution, and properties of each substance are first dealt with; then follows a discussion on its significance and variations in various clinical conditions. Much original work is included, and it is worthy of note that treatment is not neglected. In the chapter on total metabolism, the disorders of the thyroid gland are discussed. Little time is spent on classification, but the review of recent work is substantially complete though no mention is made of Holst's work on blood iodine.

Under the heading Carbohydrates, diabetes is fully considered. The authors have wisely refrained from too exhaustive a discussion on practical applications and interpretations. They have preferred to offer their own experiences and this section of the book has great value. They describe the significance of the level of the fasting blood-sugar in diabetes as depending on: (1) severity of the disease; (2) type of the disease; (3) presence or absence of complicating conditions; (4) diet, and treatment which the patient has received during the preceding period; and it is in connexion with (4) that much useful information is given. Renal function tests are compared and discussed, blood-urea and creatinine, phenolsulphonephthalein excretion, and hæmoglobin content being specially considered. Simultaneous blood-urea and urinary urea tests are strongly advocated by the authors as the most reliable indication of kidney function. By means of a simple formula, a "maximum" or "standard" urea clearance is obtained according as the patient excretes more or less than 2 c.cm. of urine per minute respectively. They regard this volume of blood cleared of urea per minute as a measure of renal function. One of them (V. S.) has stated that in hæmorrhagic (or glomerular) and degenerative Bright's disease (nephrosis), decrease in blood-urea clearance is proportional to glomerular destruction, whereas in the arterio-sclerotic kidney it serves as an index of damage to arterioles. The diagrams on the cases of nephritis illustrating the complete biochemical picture is rather difficult to follow. The different types of nephritis are referred to throughout the various chapters according to the subject matter, and this serves to provide a useful classification, based upon the work of Volhard and Fahr, and Addis. In the chapter on calcium the influence of the endocrine glands on calcium metabolism and serum calcium in connexion with the associated clinical conditions is fully discussed.

This work is encyclopædic and when complete will be a classical book of reference on quantitative clinical chemistry.

Surgical Emergencies in Practice.

By W. H. C. ROMANIS, M.B., M.Ch. Cantab., F.R.C.S. Eng., F.R.S. Edin., Surgeon to St. Thomas's Hospital, &c.; and PHILIP H. MITCHINER, M.D., M.S. Lond., F.R.C.S. Eng., Surgeon in Charge of Out-Patients, St. Thomas's Hospital. London: J. and A. Churchill. 1931. Pp. 608. 18*s.*

IN this work the aim of the authors has been to provide the practitioner with a book in which he can find really practical information on surgical conditions with which he may be compelled to deal, and the authors have taken as their definition of emergency those conditions which call for treatment, either operative or non-operative, *within 48 hours.* The pathological aspects of the subject have been omitted and in the main the text is abstracted from the authors' well-known text-book of surgery, the presentation being concise and clear. It is perhaps open to question, however, whether the definition of emergencies has not been unduly stretched, and whether a book of this type may not sometimes be an inducement to imprudent interference on the part of the practitioner. If, however, this danger is kept in mind, and the family doctor is prepared to assess each case with a modest recognition of the bearing his own lack of constant experience may have on its ultimate issue, it can do no harm. Practitioners who wish to have at hand a sound book to which they can refer before undertaking emergency surgery could do no better than to buy this book.

Prevention of Disease in the Community.

By CURTIS M. HILLIARD, Professor of Biology and Health, Simmons College, Boston, Mass. London: McGraw-Hill Book Company. 1931. Pp. 193.

MUCH important and useful health knowledge has been provided in small bulk in this book. It is up to date, interesting, and easily read. A chapter on immunity presents the known facts in a way which can be readily understood. The principles of vaccination and diphtheria immunisation are explained, and the value of such processes as a means of reducing the incidence of disease in a community are emphasised. The old theories as to the importance of bad odours and defective drainage as the causes of certain diseases, and of ptomaines as the cause of food poisoning, are effectively disposed of. A chapter on milk supplies is well compiled; the author emphasises the nutritional value of milk, but at the same time draws attention to the fact that only by scrupulous care in the methods of production and in the handling of milk can a safe supply be assured. The book should be of use to students taking courses in hygiene in secondary schools and colleges, for whom it is primarily intended, and to teachers engaged in lecturing on health to older children. It is also quite suitable for the instruction of lay-workers in public health, such as health visitors and school nurses. The photographic reproductions are not very good.

Technique, Effects, and Uses of Swedish Medical Gymnastics and Massage.

By Dr. J. ARVEDSON. Translated by Dr. MINA L. DOBBIE. London: J. and A. Churchill. 1931. Pp. 200. 12*s.* 6*d.*

IN medical gymnastics at the present time conflicting modifications of technique and outlook are being tried out and assessed. It is useful therefore to have a clear statement of orthodox practice in our hands. We are thus indebted to Dr. Mina Dobbie for her initiative and energy in giving us a translation of the second revised edition of Dr. Arvedson's "Handbook of Massage and Medical Gymnastics," which, with its companion volume—"Medical Gymnastics and Massage in General Practice"—is based on the principles of the Central Institute, Stockholm. The book before us is clear in matter, type, and general arrangement. Dr. Arvedson, unlike Ling, prefers to consider massage as an entity, and not a subdivision of medical gymnastics; so the first section of the book is devoted to an able description of massage technique with explanations of the effect and reactions of each kind of massage. More space is devoted to direct nerve treatment than in many similar handbooks, and clear anatomical guides for accessible treatment points of the peripheral nerves are supplied. This is of value in indicating—as does the Kellgren-Cyriax method—that many nerve injuries or loss of tone can in skilful hands be dealt with outside the electrical department. In each section, whether referring to remedial movements, special scoliosis treatment, or to grouped exercises influencing circulation and respiration, the muscle work, aims of treatment, and effects are clearly outlined. Home exercises are described and the book finishes by applying the knowledge accumulated to general rules for compiling medical gymnastic tables, or one might say, a medical prescription of exercises.

Those teachers who are working on very modern lines may regret that Dr. Arvedson has not incorporated newer tendencies, such as the emphasis on rhythm and mobilisation in re-educative work, but for examination purposes the book supplies a sound structural basis, and is a good handbook for students. The book is freely illustrated and though the photographs date from 1906 and show in some cases a rigidity of posture not now affected, they serve their purpose well.

Archives of Neurology and Psychiatry.

From the Central Pathological Laboratory of the London County Mental Hospitals, Maudsley Hospital, Denmark Hill, London. Edited by FREDERICK L. GOLLA, M.B. Oxf., F.R.C.P., Director of the Laboratory and Pathologist to the London County Mental Hospitals. Vol. X. London: P. S. King and Son, Ltd. 1931. 15*s.*

THIS tenth volume of the Archives consists, like its predecessors, of a series of reprints of papers by the various workers in the pathological department of the London County Mental Hospitals Service. The articles cover a very wide range. There are several on the pathology of general paralysis, and its treatment by induced malaria and tryparsamide. Others deal with the state of the blood in the psychoses; for instance, the sugar and chlorine content, the protein partition of the serum, and the acid-base equilibrium. Dr. Golla himself writes on some recent work on the pathology of schizophrenia, and with Dr. S. Antonovitch on the respiratory rhythm in its relation to the mechanism of thought and on the relation of muscular tonus and the patellar reflex to mental work. Among papers reprinted from THE LANCET is one on the excitability of the respiratory centre of psychotics by Dr. R. G. Marsh; studies in the acid-base equilibrium by Dr. Isabella Robertson; an article on the functions of the liver in induced malaria by Dr. R. G. Williams; and Dr. E. Mapother's impressions of psychiatry in America. Three papers deal with epidemic encephalitis: the patellar reflex, the ocular syndrome, and the oculogyric crises.

The twenty-six contributions gathered here constitute a valuable contribution to psychopathology, and their presentation in one cover will be a convenience to those interested in this branch of medicine.

Gynecological and Obstetrical Pathology.

Including chapters on the Normal Histology and the Physiology of the Female Genital Tract and the Peritoneum. Second edition. By ROBERT TILDEN FRANK, A.M., M.D., F.A.C.S., Gynecologist to Mount Sinai Hospital, New York City. London: D. Appleton and Co. 1931. Pp. 547. 30*s.*

THE first edition of this book appeared eight years ago. The many notable advances in the interval have made it necessary to rewrite certain sections, especially the chapter dealing with the relation of the normal histology of the female genital organs to symptoms and physiological function. A new chapter has been added dealing with the peritoneum, and that on obstetric pathology has been amplified. The title of this book is rather misleading, since the part dealing with obstetric pathology extends to only 45 pages, and this includes ectopic gestation and chorion epithelioma. The author almost disarms criticism by his admission that "to deal adequately with this large subject would require a separate volume." Two outstanding features of the book are the bibliography at the end of each chapter and the 423 illustrations, almost all of which are original. As a work of reference it is valuable.

THE LANCET.

LONDON: SATURDAY, JUNE 13, 1931.

LONDON'S UNIVERSITY CENTRE.

THE housing of the University of London, which has been for years the subject of acrimonious discussion, seems likely to be finally provided for on a site of some ten acres northward of the British Museum. The headquarters of the University have been successively located at Somerset House, Marlborough House, Burlington House, Burlington-gardens, and at South Kensington, and as reported in 1911 by the Royal Commission, of which Lord HALDANE was chairman, "His Majesty's Government has been responsible for the housing of the University throughout its history." The University buildings in Burlington-gardens, familiar to an earlier generation of graduates, were erected by and at the expense of the Government in 1871 for the exclusive use of the University, and the foundation-stone still bears its name, while its adornment with the statues of NEWTON, HARVEY, LOCKE, BENTHAM, and others testifies to the academic purpose of the buildings. It was in 1899 that the Senate was induced, somewhat reluctantly, to transfer the University headquarters to what was described by the Treasury as "an adequate and dignified home for the University in the Imperial Institute buildings" at South Kensington. At that time, under the Act of 1898, the University was undergoing one of its reconstitutions, and the Government vouchsafed, in a Treasury minute of Feb. 16th, 1899, that the new accommodation would *not only* be fully equal to that at Burlington-gardens but that there should also be "such provision as may hereafter be needed for the full extension and development of the University under the statutes and regulations made by commissioners appointed by the Act of 1898."

Within ten years it was evident that the accommodation at South Kensington was quite inadequate for the growing work of the reconstituted University and was also inconvenient in other respects. In 1912 a first attempt, which proved abortive, to remove the University to a site in Bloomsbury attracted public attention. Other sites at Hampstead, at Kensington, at Somerset House were suggested, and the Senate at one time favoured the Foundling Hospital site for its future home. When Mr. H. A. L. FISHER was President of the Board of Education in 1919 he advised the Government to offer to the University "a site and buildings near the British Museum." In 1920, however, this offer was modified to the exclusion of providing the buildings; it was also conditional on the transfer of King's College to the Bloomsbury site and the surrender of the present premises of the University as well as the site and buildings of King's College to the Government. Owing to the refusal of King's College to move, the offer was declined by the Senate. Eventually, however, the site, after resale to the vendor, was purchased in 1927 for £525,000, the Government contributing £212,500, while the Rockefeller foundation generously provided the funds required for completing the acquisition of the land. The Treasury made their contribution on the understanding that it was "intended to be in full satisfaction of any liabilities that might be deemed to lie upon the Treasury under the Treasury minute of 1899 to provide accommodation for the future development of the University."

On Presentation Day last month Earl BEAUCHAMP, the Chancellor, announced that the Court of the University were within sight of securing the money for the buildings to be erected on the site during the next five years, and that the laying of the first stone would take place within the next twelvemonth. Mr. CHARLES HOLDEN, F.R.I.B.A., has now been appointed the architect, and among the first buildings to be erected will be the administrative offices and University hall, the Library, and premises for the institute of historical research, the Courtauld institute of art, and the officers' training corps. The Birkbeck college, the London day training college, the students' union, and possibly residential chambers may also be erected on the site. The cost of the scheme is anticipated to be between £2,000,000 and £3,000,000. The Court may congratulate themselves on having secured Mr. HOLDEN for so important and responsible a task. The new Underground building at St. James's Park, and the King's College for Women at Campden Hill are examples of the beauty and distinction of his conceptions.

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A MATERNITY SERVICE.

WHILE much has been written about mortality in childbed, the crippling effect of maternity upon many of the survivors has not received the attention it deserves. Some 3000 women die each year in England and Wales as the direct result of childbirth, but it is almost as disturbing to know that 60,000 mothers, or 10 per cent. of the whole parturient population, are disabled, many of them gravely. If the late results of child-bearing are considered, an additional figure of 5000 may be added to the primary mortality, giving a total annual loss of 8000 women in England and Wales. These facts cited in Prof. BLAIR BELL's first Ingleby lecture, published in our issue of May 30th, constitute a grave indictment of the present-day risks of motherhood and emphasise the urgent need for coördinated national effort to combat them. His second lecture, which appears in this issue, sets out the basic principles which should underlie any comprehensive scheme of remedy. Prof. BELL envisages the formation of a central council, small in number, and consisting of representatives of all interested parties; such an ad-hoc body would presumably act in an advisory capacity to the Minister of Health, and as such its establishment should have the support both of practising obstetricians and of public health authorities. It is refreshing to find someone calling a halt in the present competition between voluntary and municipal effort, and advocating the pooling of existing resources. Year by year under the pressure of public opinion the State is accepting greater responsibility in attempting to solve the problems of maternal mortality and disablement. Stimulated by the Ministry of Health many municipalities are erecting large maternity hospitals and conducting maternity homes. Prof. **Bell** points out that these institutions are coming under the ægis of the local medical officers of health without reference to local obstetricians, with the result that the beds are not available for teaching purposes and, what is more important, are not always in the charge of experts. Chaos results from the curious fact that whilst financial resources are at the disposal of the public authorities, expert knowledge and skill are at present almost entirely at the disposal of the voluntary organisations. Such a distribution of assets must lead to wastage of public funds without corresponding gain in net results. Pooling of available resources—intellectual, material, and financial—is essential in order to ensure efficiency in the medical, nursing, and administrative services.

The scheme outlined by Prof. **Blair Bell** includes and utilises all existing facilities without needless multiplication of small units, isolated in function and personnel. Many of the municipal antenatal clinics and maternity homes are staffed by young medical graduates with a public health diploma and a few months resident experience at a maternity hospital. Applications are being received by teaching authorities from medical officers of health to provide short post-graduate courses to fit junior officers to take up new duties in the maternity service. But expert obstetric knowledge cannot be gained by attendance at such courses, and the possession of a diploma in obstetric medicine should be of more value than a diploma in public health for those who accept the responsibilities of obstetric practice. The problem is really one of organisation and the proper utilisation of existing facilities, rather than of additional units. In many communities, large and small, in Great Britain to-day we have voluntary and municipal hospitals existing side by side, each jealous of the activities of the other and yet both working for the common weal. On the one side is tradition coupled with expert knowledge and skill; on the other are the facilities provided by public funds and administrative capacity. Prof. **Bell** conceives of base, field, and emergency hospitals, coupled up with existing antenatal, postnatal, and infant welfare clinics, the whole supervised and directed by the Ministry of Health through a central advisory council, and bridging the gulf between conflicting interests. General medicine and surgery are no doubt confronted with similar problems, but their need is not so urgent. For a truly national maternity service this country has the personnel, the necessary expert knowledge, skill, and equipment at its disposal if it will but use them.

On the position of nursing in such a service Prof. **Bell** holds views which will meet with criticism. He would have every midwife a fully qualified and State-registered nurse, and he points to the fact that the best results quoted in this country are those of the "Jubilee" nurse-midwives. In Sweden, where mortality from obstetric causes is notably low as compared with such countries as Ireland and the United States, the majority of confinements are attended by midwives who have had two years' training without general medical and surgical experience, and this fact has been used in support of the argument for maintaining the British midwife and improving her training. Conditions in Scandinavian countries are however very different from conditions here. The careful selection of women chosen for training, the good physique of the mother, the large proportion of confinements taking place in hospital, all these favour the Swedish solution. British mothers are often not of good physique; partly from choice and tradition, partly from necessity nine-tenths of them are confined in their own homes; the midwife may be an uneducated woman with a short and special training. Few would dissent from Prof. **Bell** that the fully certificated nurse-midwife, if available, would be a great asset in a maternity service; unhappily no more than 25 per cent. of the nurses who obtain the C.M.B. certificate subsequently practise midwifery. The work is arduous and the rewards poor. But with improved conditions of service, better educated and better trained women would be attracted and in course of time the midwife pure and simple would be superseded. The provision of hostels, regular hours and holidays, adequate payment and a system of promotion are all factors which must enter into the establishment of an efficient service. There is no lack of material if it is mobilised upon sound lines.

On the urgency of the problems set by Prof. **Bell** there can be no difference of opinion and his appeal to the Ministry of Health, the public health services, the voluntary hospitals, and the practitioners generally should not pass unheeded.

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OUR PRISON POPULATION.

The annual report [1] of the Prison Commissioners, just issued for the year 1929, contains the usual survey by the Medical Commissioner. It is the last we shall have from Dr. G. B. **Griffiths**, who retired last year after long and honourable service, and was succeeded by Dr. **Norwood East**. Dr. **Griffiths** contrasts present prison methods with those which obtained when he first took up work as medical officer over 35 years ago. There were then no Mental Deficiency Acts. The cases now known as mental defectives were lumped together, with those now considered non-certifiable, under the vague description "weak-minded," and were usually treated under modified prison discipline.

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[1] H.M. Stationery Office. Cmd. 3868. 1s. 6d.

Until the enactment of Section 1 of the Act of 1913 (afterwards modified in 1927), the medical officer had no standard to work to, except perhaps Maudsley's dictum respecting "absence or deficiency of a greater or less number of the cerebral reflexes"—a standard which, as Dr. GRIFFITHS remarks, could not confidently be mentioned in court because it might conceivably be applied to the deaf, dumb, or blind, and could hardly do general duty in relation to criminal responsibility. Before the 1913 Act the mentally deficient prisoner, on completing his sentence, took his gratuity and was discharged in the ordinary way. Naturally the gratuity was often quickly spent in riotous living, and the discharged prisoner was soon back in prison, having had little to do but commit another offence. With this former looseness of treatment Dr. GRIFFITHS contrasts the modern method—the careful psychological investigation working to the statutory standards, the medical officers alert to recognise and classify mental disease, the certification of the prisoner under the Lunacy or Mental Deficiency Acts, or else his transfer to a special department for mental defectives or a special section set apart for observation, training, and work, and finally, the care for his future if he is still considered uncertifiable on completion of his sentence. Dr. GRIFFITHS estimates that the administration of the 1913 Act has reduced the average daily prison population by at least 200.

We discussed lately[2] the danger and expense which the community suffers through criminal lunatics under a system which has often failed to recognise insanity until crime has been committed. The figures which we then gave are supplemented by those now available in the report under review. In local prisons 102 prisoners were certified insane during 1929; in addition, 278 remand prisoners were found by medical officers to be insane and were dealt with by the courts; 19 persons were found to be insane on arraignment, and 20 were found (in the ridiculous and indefensible phrase which the law has not yet abandoned) "guilty but insane." Another 2268 persons were remanded to prison for observation so that report on their mental condition could be furnished to the court. In a paragraph on the work of aid societies to the discharged prisoner, the report cites other evidence of the mental and physical level of the male convict. Figures supplied last year by the Central Association for the Aid of Discharged Convicts indicate that, out of 1600 men discharged to the care of the association in a period of three years, over 400 were fit for light labour only, 40 were completely unfit to earn a living, and 100 were of low mentality.

Gradually, it seems, our prisons are being emptied. In 1913 the daily average population was 18,155; in 1929 it was 10,861. In this 16-year period the average figure for local prisons has dropped by nearly one-half; it has thus been possible to reduce the number of local prisons from 56 to 31. In the same period the figure for convicts in penal servitude has come down from 2704 to 1461. Sentences, of course, are growing more lenient. In 1913 there were 12 life sentences, in 1929 only one. The size of our prison population is naturally governed not only by length of sentence, but also by the number of committals. There was in 1929 a decline in committals though, as the report explains, this is not due to a positive decrease in crime. Recent criminal statistics show that crime, judged at any rate by the totals of indictable offences known to the police, has not in fact decreased in the past 20 years; but many offences formerly punished by imprisonment are now dealt with by fine or probation. In non-indictable offences such as drunkenness, assault, prostitution, begging, and sleeping-out, there is a striking decline in the number of prisoners; this result can fairly be attributed to improvement in social conditions and social behaviour. Notes by the governors of various prisons suggest that magistrates are still sending youngsters to imprisonment without first exhausting other possibilities. One boy found his way to Birmingham prison for failing to pay a fine for breach of a by-law forbidding throwing stones into the canal, another for riding a bicycle without a light. Kind friends soon paid the money and found employment; could not this have been done without imprisonment? Some instances are undoubtedly difficult. The governor of Winchester prison had 50 lads and young men from Southampton convicted as stowaways. Many were youngsters of excellent character, and the standard sentence of 28 days hard labour looks a little old-fashioned in their case. Women prisoners are dwindling to very small numbers; many of them commit only minor offences. Two women in Hull prison are stated to have nearly 50 convictions for drunkenness; their drink is methylated spirits; they come back to prison month after month for 28 days, and are seldom at liberty for more than a few hours. Frequent return to prison seems also to be a habit of civil process prisoners—such as those who fail or refuse to pay rates, bastardy arrears, or sums due under orders for wife maintenance. If there are people who imagine that imprisonment for civil process is non-existent, they will be surprised to read that there are several thousands of such prisoners. The report has interesting comments on recidivism, prison industries and payment, the Borstal system, and the development of education (and possibly entertainment) by wireless. An appendix contains notes in which voluntary workers describe their experiences. It is tempting to quote such extracts as the aphorism that "few men with hobbies come to gaol." Readers who appreciate the devoted work of the prison visitor should study these notes in full.

EXTENSION OF MERTHYR HOSPITAL.—A memorial to the late Lord Buckland in the form of an extension, which has cost £40,000, of Merthyr Tydfil General Hospital was opened on Friday last, when a bronze statue of him by Sir W. Goscombe John was also unveiled. The enlargement provides greatly increased scope for radiological work, massage, and orthopædic treatment, with specialised departments for eye, ear, and throat cases, together with several extra wards, one of them for children. Sun balconies are attached to the various wards. Lord Buckland was president of the hospital.

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[2] See THE LANCET, May 30th, p. 1200.

ANNOTATIONS

DIRECT REPRESENTATION ON THE G.M.C.

At this summer session of the General Medical Council it was held expedient to confer on registered practitioners resident in England and Wales the power of returning an additional member to the Council, and the Privy Council is to be asked to obtain Royal assent, on the understanding that the addition shall not be made until the next election of direct representatives. The last such addition was made in 1909 on the motion of Dr. Langley Browne, who pointed out that representation had been given to the new universities, without additional direct representation to the great body of the profession in the country. His motion was carried by 17 votes to 5, 8 members of the Council abstaining and 3 being absent. Sir Norman Walker, in proposing the addition last week, said that at the first election in England and Wales there had been one representative for 6000 doctors; at the last election the proportion had fallen to one for 8000. In Scotland there was one representative for 5000, and in Ireland one for 3500. It was therefore not unreasonable to suggest that England and Wales should have five instead of four members. He regretted that it was not possible to couple the recommendation with one for redistribution of the constituents. The four present representatives, he said, usually came in and went out in pairs, although occasionally there had been four elections in a year; the addition, he thought, should not be made until the next election. Dr. Letheby Tidy suggested that the proportion of direct representatives to the total size of the Council should be taken into consideration, as otherwise the mere increase in number of practitioners on the Medical Register might be held to justify further representation. Sir Holburt Waring also deprecated taking the size of the constituency as a criterion for representation. One or other of the bodies now represented might demand a second representative on the ground of having 18,000 or more members. The Council, he thought, was already large enough. Sir Robert Bolam, in supporting the motion, said the claim was not based merely on numbers. A very cogent reason was the increasing necessity to have men on the Council in close contact with the daily life of the profession; particularly was this the case in disciplinary work. The complexities of the doctor's new relationship with municipalities and governmental departments were not readily understood by those not engaged in practice. The Council, he thought, should not lay itself open to the reproach of being out of touch with the realities of professional life throughout the country. Money thus spent would be worth spending. Sir Norman Walker's motion was carried by a large majority.

RECURRENT VASCULAR KERATITIS.

Common causes of vascularisation of the corneal surface (as distinguished from interstitial keratitis) are corneal ulcer and phlyctenular disease. A less common cause in this country is trachomatous pannus. It also occurs in connexion with facial acne and mechanical irritation from in-turned lashes. In rare cases it is found without any obvious cause and with recurrences that may continue for years.

Mr. J. H. Doggart[1] has collected twelve of these cases, seven men and five women between the ages of 18 and 62. In four of them the trouble began with a marginal ulcer of the cornea and in five others the corneal invasion followed repeated attacks of conjunctivitis. The cornea is invaded by superficial vessels round its whole circumference. Greyish opacities with indistinct outlines are present in the cornea and with each successive attack the vessels and the opacities approach nearer to the central area when vision is necessarily seriously impaired. Although there is no corneal ulceration in the early stage of these opacities, few cases of long standing escape it. The causation of the disease is obscure, but septic absorption, especially from the teeth, is a possible cause. Apart from cases where a definite septic focus is found the treatment is unsatisfactory. Locally the old-fashioned operation of peritomy can be tried.

STERILISATION AND MENTAL DISEASE.

For many years Dr. Rüdin has been investigating the problems of racial psychiatry in Germany. In a pamphlet issued by the Eugenics Society[1] he summarises some of his more salient findings, as well as his present views on the steps that might be taken to reduce the incidence of hereditary diseases. Among the morbid conditions considered are Huntington's chorea, myoclonus epilepsy, schizophrenia, manic-depressive insanity, idiopathic epilepsy, alcoholism, and mental defect. Rüdin's findings in an extensive statistical investigation of schizophrenia and manic-depressive insanity lead him to think that genetic carriers of these conditions may often be detected through their exhibiting psychological abnormalities of minor grades. "Where one parent is schizophrenic (or where both show a high degree of mental abnormality, as is so often the case in schizophrenic families) 9 to 10 per cent. of the children," he says, "are schizophrenic, with an additional 34 to 42 per cent. of psychopaths of less severe grades, some nearly resembling schizophrenia; this gives a total of 43 to 52 per cent. of offspring affected in one way or another. Where both parents are schizophrenic 53 per cent. of the offspring are schizophrenic and 29 per cent. psychopaths. This gives a total of 82 per cent. of mentally affected individuals and a residual 18 per cent., in whose case, it should be noted, the account is not yet closed, as the attack may occur at later ages." "Manic-depressive insanity," he says, "is more strongly inherited. Where one parent is a manic-depressive 30 to 33 per cent. of the children will show the same disease; there will also be a number of cyclic psychopaths of less severe grade which at its minimum equals the clear-cut cases; thus, the total percentage of mentally afflicted offspring is at least 60 to 66 per cent. Where both parents are manic-depressives, 60 to 65 per cent. of the offspring will inherit the disease, and 35 to 40 per cent. will exhibit minor forms of cyclic abnormality. In fact, practically all the offspring will here be mentally abnormal." It was, moreover, found that the expectation of schizophrenic insanity in Munich and a considerable part of Bavaria reaches 8·5 per 1000 in the average of the population and that of manic-depressive insanity 4·1 per 1000. Rüdin concludes his review of the incidence of these disturbances in the following words: "Any instructed person viewing this situation from a humane standpoint can scarcely escape the conclusion that sterilisation is indicated in these cases." He ends his paper with a plea for more intimate coöperation between geneticists and medical men. Only thus, he holds, can the necessary information be accumulated to enable us adequately to supplement, by genetic methods of prophylaxis, the activities of those who seek to prevent mental illness by applying to the individual the principles of mental hygiene. The application of sterilisation as a preventive eugenic measure is apparently as much hindered in Germany as in England by uncertainties as to the state of the law.

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[1] Proc. Roy. Soc. Med., 1931, xxiv., 6.

[1] Psychiatric Indications for Sterilisation. By Ernst Rüdin. (Abridged translation.) Obtainable from the Eugenics Society, 20, Grosvenor-gardens, London, S.W.1. 6*d*.

OBSERVATIONS ON POST-VACCINAL ENCEPHALITIS.

THE investigation of cases of post-vaccinal encephalitis has usually led to the opinion that although vaccination is the exciting cause, and a certain stage in the development of the vaccinal infection has determined the time of onset of the nervous symptoms, nevertheless some added factor is needed to set up encephalitis. That this adjuvant is not purely accidental is shown by the irregular distribution of the cases in time and place, especially the preference for certain years or periods and for the smaller communities as opposed to large towns, and by the occasional appearance of groups of cases in small rural areas. There is still a wide divergence of opinion as to whether infection with vaccinia virus itself is the actual cause of the changes in the central nervous system. It has frequently been suggested—notably by the two British committees which reported in 1925 and 1928, and by the Dutch Committee—that post-vaccinal encephalitis may be due to vaccination rousing into activity a latent virus infection. It was thought that widespread latent infections with poliomyelitis in a community might present opportunities for a combined action of the viruses of these two diseases. Such coöperation might be due either to poliomyelitis producing modified lesions in a central nervous system also infected by vaccinia or to some other kind of simultaneous activity of the two agents. That poliomyelitis virus has taken part in the production of post-vaccinal encephalitis has been rendered improbable by comparison of the relative seasonal prevalences of the two diseases and by the definite histological dissimilarity in the great majority of cases. Nevertheless, evidence has been put forward which suggests that a combined action of two viruses might have important results. In 1914 workers at the Rockefeller Institute[1] showed that poliomyelitis virus given intravenously to monkeys did not produce the disease unless damage was also done to the meningeal barriers, and O. Thomsen in 1912 claimed that incubation of mixed poliomyelitis and vaccinia virus into the skin produced typical poliomyelitis. Some experimental evidence of activation of a latent herpes infection by vaccination was advanced by Zurukzoglu in 1927. Dr. E. W. Hurst and Dr. R. W. Fairbrother[2] have lately tested these hypotheses in the laboratory on ten monkeys by combined inoculation into the brain or intravenously, and by inoculation of the skin with vaccinia and the brain with poliomyelitis. They found no reason to suppose that these viruses had any influence on the independent action of each other. The experiments do not give any positive help in the solution of the problem, but make the suggested influence of vaccinia on latent poliomyelitis virus extremely improbable, and give no support to the hypothesis of a combined action of two distinct viruses.

SHORTAGE OF MEDICAL OFFICERS AND NURSES IN THE SERVICES.

THE Prime Minister has appointed a committee to investigate the causes of the shortage of officers and nurses in the medical and dental branches of the three defence services, and to recommend means whereby it may be overcome. Sir Warren Fisher is the chairman and the medical members are Sir Harold Fawcus, director-general, Army Medical Services; Prof. G. E. Gask, director of the surgical unit at St. Bartholomew's Hospital; Sir Arthur Gaskell, medical director-general of the Navy; Dr. A. M. H. Gray, dean of University College Hospital Medical School; and Air-Commodore J. C. McIntyre, director of medical services, Royal Air Force. The secretary is Mr. M. Lindsay Scott, of the Air Ministry.

OSTEOPATH AND ANÆSTHETIST.

PARLIAMENT in 1858 declared the object of the Medical Act to be to enable persons requiring medical aid "to distinguish qualified from unqualified practitioners." For this purpose the Act created a system of registration and instituted the General Medical Council (not necessarily an exclusively medical body) to maintain the Medical Register and to supervise medical education under the control of the Privy Council. If persons requiring medical aid are to be enabled by means of the Register to distinguish the qualified from the unqualified, it follows that any form of partnership or alliance between a qualified and an unqualified practitioner must be ruled out; otherwise the distinction would inevitably be confused. The General Medical Council did no more than faithfully interpret the expressed intention of Parliament when its Warning Notice reminded registered medical practitioners that, if by their presence, countenance, advice, assistance, or coöperation they knowingly enabled an unqualified or unregistered person to engage in medical practice as if such person were duly qualified and registered, they would be liable to have their names erased from the Register. An advertisement by an unregistered osteopath requiring the part-time coöperation of an anæsthetist who must be a registered practitioner was sent to us lately for insertion. It being no part of the policy of THE LANCET to facilitate evasion of the Medical Act, the advertisement was not inserted. Any disadvantage caused by its rejection, however, has since been mitigated by an access of publicity. A daily newspaper, not so angry perhaps with medical journals which have rejected such advertisements as with the General Medical Council for the latent threat of removing the prospective coöperator's name from the Register, has used hard words of this "monstrous tale of medical obscurantism" and "benighted opposition of the medical hierarchy." Thus a generous-minded public is invited again to look upon osteopathy as a profession persecuted by the vindictive tyranny of a medical trade-union which cannot forgive the osteopath his successes.

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[1] Flexner, S., and Amoss, H. L.: Jour. Exp. Med., 1914, xix., 411, and xx., 949; Clark, P. F., Fraser, F. R., and Amoss, H. L.: Ibid., 1914, xix., 223.

[2] Hurst, E. W., and Fairbrother, R. W.: Brit. Jour. Exp. Path., 1931, xii., 17.

although the dried unripe fruit is still official in the American book. Accidental poisoning is rare and should be rarer if the biological warnings are heeded, for the whole plant possesses an offensive smell, reminding some of mice and others of the urine of the male cat, while the stem and often the leaves are spotted as no other umbelliferous plant. Moreover, like the greater celandine, the hemlock grows chiefly not in pastures but in hedgerows and waste places within short range of human habitation, both being dependent on a supply of nitrates in the soil. Heavy responsibility attaches to the apothecary who introduced the plant early last century into Chile, where it has since run wild on the nitrated soil. For then the Victorian poet's advice to avoid the weedy bank will not save the cow from chewing the hemlock rank. Apparently when cultivated the plant may lose its unpleasant smell. The dried seeds, although readily distinguishable to the botanist from anise, may be a danger when, as according to Hegi is the case in Italy they are present to the extent of 10 per cent. in commercial samples of this seed.

CENTENARY OF THE HARVEIAN SOCIETY.

THE Harveian Society of London was constituted on Sept. 15th, 1831, as the Western London Medical Society, and less than a fortnight later changed its name to the Harveian Society "in token of the intent strictly to adhere to the course of observation and induction so successfully pursued by the illustrious discoverer of the circulation of the blood." For a hundred years it has adequately fulfilled the purpose of bringing together medical men of every branch of the profession, and its discussions have always been full, free, and intimate. The meetings were formerly held in a room belonging to the Y.M.C.A. in Titchborne-street, just south of Oxford-terrace, Hyde Park, but since the building was demolished by a German bomb, the society has usually met at the Paddington town hall. Its existence for a long period was somewhat uneventful; a little money was accumulated, a lectureship was founded, and the members dined together once a year and occasionally invited their friends to a conversazione where they could smoke, drink, and listen to music. But the election of the late Dr. Charles Buttar as president in 1909 and the advent of Dr. Godfrey de Bec Turtle as treasurer completely reorganised the society. Members whose subscriptions had been years in arrear were no longer tolerated; new honorary and foreign corresponding Fellows were elected, and there was soon a rush of applicants for the ordinary membership. The position was presently strengthened by the generosity of Mr. G. Buckston Browne, who had served on the council and in 1901 had delivered the Harveian lectures. Mr. Buckston Browne well knew the friendly feeling which had always characterised the society and also recognised that research was one of the objects which had been in the minds of the founders but had never been properly carried out for want of funds. He gave, therefore, enough money to perpetuate a love feast and to endow a prize and medal for original work.

The centenary celebrations are going on during the present week under the direction of Sir Thomas Horder, the president, Dr. de Bec Turtle, the treasurer, Mr. C. P. G. Wakeley and Dr. Ronald Cove-Smith, the hon. secretaries. They began on Thursday with a meeting in the Great Hall at St. Bartholomew's Hospital, when Prince Arthur of Connaught was elected an honorary member, and Dr. Raymond Crawfurd delivered the address printed at the front of our present issue. The Buckston Browne dinner takes place in the Grocers' Hall to-day, Friday, with Prince Arthur as the principal guest. In conclusion, Saturday is being devoted to a pilgrimage to Hempstead, in Essex, where William Harvey and many members of his family are buried.

AN ORTHOPÆDIC CENTRE.

THE Wingfield Orthopædic Hospital at Oxford serves the three counties of Oxfordshire, Buckinghamshire, and Berkshire, and the waiting-list is a long one, despite continuous hard work at high pressure. As the years go on there is a slight change in the character of the work. The severe deformities dating from birth or childhood do not now form so large a proportion of cases. This the report before us ascribes to the spread of education and the supervision of child life. It is the industrial cases that are on the increase; the great demand is now for adult male beds for a type of case for which there is no grant from public bodies. A recent gift by Sir William Morris illustrates the recognition by a great employer of labour of the value of the work to the nation and its industry; many of the patients would never again be able to earn their living but for the treatment which they receive, and 15 years ago they would have become a burden on the tax-payer or on the employer. Now those who cannot return to their former occupation are trained in the workshops so that they can at least earn a living. Sir William Morris, hearing that the hospital would have to be rebuilt and that plans for the replacement of four wards were complete, asked to see the plans and gave a sum of £47,000 to defray the cost of rebuilding the hospital, nurses' quarters, and trainees' hostel. The committee were therefore enabled to concentrate on the one problem of erecting an up-to-date hospital. The new wards will be completed during 1931, and arrangements have been made so that the work can be carried out without reducing the number of patients. During 1932 it is hoped to complete an administration block, including operating-theatre, X ray and massage department, gymnasium, plaster-room, and offices. This generous gift does not, however, reduce the need for donations and subscriptions, since the work of the institution could be very largely extended if accommodation were available for all those waiting for help. The fight against tuberculosis goes on without ceasing, and there is very little decrease in the number of cases; although a majority of them now come at an earlier and more hopeful stage than was usual in the past. The work of the numerous out-patient clinics throughout the area served has increased considerably during the year, and an attempt is being made to obtain a complete list of cripples. Good progress has been made at the special school of the hospital, where there are 68 children of school age and 24 workshop trainees. Two new handicrafts were introduced during the year: barbola work for girls, and cane-seating and chair-weaving for boys. There is still a long waiting-list of youths from all parts of the country desiring admission. News of former trainees proves that properly trained cripples can compete successfully with those who have no disability.

ON Tuesday, June 30th, the Duchess of York, as president of St. Mary's Hospital, will lay the foundation-stones of the new medical school and pathological institute. The proceedings will begin at 3 P.M., and Mr. Stanley Baldwin will give a short address.

PANEL AND CONTRACT PRACTICE

INSURANCE PRACTITIONER AND SICKNESS CLAIMS.

The insurance practitioner has not only to treat isease but also, to an extent not required in any other eld of medical practice, to estimate and advise upon e physical and mental fitness of his patients for munerative work. His opinion, expressed in a rtificate given to the insured person, supports each aim for sickness or disablement benefit, and for idence of a member's capacity for work the approved ciety to which he belongs has to look in the first stance to the practitioner from whom the member receiving medical treatment. From the commencement of national health insurance many practitioners re found it difficult to make an estimate of capacity, and a comprehensive memorandum 29/I.G.) issued last week deals with (i) the marked d continuous rise in benefit claims observed in recent ars; (ii) information obtained through recent restigations respecting the causes of the increase claims; (iii) the recent introduction of new regulans[1] for dealing with apparent failure to exercise sonable care in the issue of certificates of incapacity.

SOME ELEMENTARY EXPLANATIONS.

The system, it is recalled, is one of insurance inst the loss of earning power through sickness injury by weekly contributions paid by insured sons and their employers, supplemented in a fixed portion by the taxpayer. These benefit funds st be applied in providing medical, sickness and ablement, and maternity benefit for all insured sons, as occasion may arise, the contributions ing been actuarially calculated to secure the vision of those benefits. Any surplus must equally be used for the provision of additional benefits such as dental or ophthalmic. Protection of the funds against payments to persons not entitled to benefit is afforded in the first instance by the requirement that each claim must be supported by a medical certificate, a second line of protection being afforded by the supervision of claims by approved societies exercised through (i) administrative officers, (ii) sickness visitation, and (iii) reference of doubtful cases to medical referees. Every payment of sickness or disablement benefit to an insured person who is not incapable of work diminishes the funds that would otherwise be available for the benefit of other members of a society. The memorandum notes that the payment to each claimant in a year of a single week's benefit beyond that to which he is properly entitled would have the result of speedily bringing a large proportion of all societies to a state of insolvency. Primarily such illegitimate payments reduce the amounts available for provision of additional benefits. If such payments continue progressively to increase they must ultimately result in a reduction of the statutory benefits or an increase of the contributions requisite to maintain those benefits. Certifying practitioners are asked to realise that they are in a position of responsibility which is abused when they, for any reason, assist any of their patients to obtain, at the expense of their fellow members, benefits to which they are not entitled.

INCREASED SICKNESS PAYMENTS.

There has been in recent years a rise in claims for sickness and disablement benefit of such magnitude as to occasion grave concern among all engaged in the administration of these benefits. Between 1921 and 1927, for instance, the percentage increase in the total number of weeks covered by claims to sickness and disablement benefits was as follows:

—	Sickness benefit.	Disablement benefit.
	Increase per cent.	
Men	41	85
Unmarried women ..	60	98
Married women ..	106	159

and subsequent investigations show that though the claims have fluctuated since 1927, there has been no substantial improvement since that year. In considering possible causes of this increase the most important question is how far it may have been due to an increase in incapacitating sickness and how far to an increase in payments to persons who were not incapable of work. The report of the Government Actuary, published last year (Cmd. 3548), while establishing the continuous rise of claims for both sickness and disablement, brings out the fact that the increase has been in the number of claimants (per cent. of society members) and not in the average duration of claims, which has varied very little. As regards men, the increase in the number of claimants has been mainly in claims of short duration, and among the younger insured persons. The increase has been greater among women than among men, and among married than among single women.

Causes of Increase.

These facts suggest that the increase may have been due not so much, if at all, to an increase in the amount of incapacitating sickness as to economic or other causes not dependent on state of health. If, over so long a period, there had been any corresponding increase of ill-health, there is no apparent reason why it should have manifested itself chiefly in illnesses of short duration, and not to a corresponding extent in cases of serious sickness, causing prolonged incapacity. Secondly, there is no apparent reason why such a change in general health should have affected women to an appreciable degree more than men, married women more than single women, or young people more than old. Thirdly, there is no collateral evidence indicating that the general health of the insured population was appreciably, if any, worse in 1927 than in 1921. On the other hand, reasons readily suggest themselves which (i) might make women more ready to claim than men, married women than single women, and the younger than the older, when in the same state of health, and (ii) might increase the tendency to claim in respect of minor ailments, while not appreciably affecting the tendency to claim in cases of serious illness. But these affect the disposition of insured persons to claim, not the medical justification for issue of certificates of incapacity.

TWO RIDERS.

It has been pointed out by doctors that the observed increase of claims may be partly accounted for by cases of persons who, being genuinely incapable of work, now claim and receive benefit but would not have claimed in the same circumstances ten years ago—the explanation suggested being that it has been due partly to the effects of the present economic depression, as compared with conditions of earlier years, and partly to the greater attention now given by insured persons to considerations of health, through the operation of educational measures of the last ten years, and a change of attitude, for other reasons, towards the claiming of insurance benefits. That there are such cases is common knowledge, but they are not numerous enough to have a substantial effect in producing the observed differences in payments of benefit.

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[1] See THE LANCET, Jan. 3rd, p. 53.

It has been stated on behalf of insurance practitioners that there has been no lowering since 1921 of their standard of medical certification. The memorandum does not seek to challenge this statement, which is in any case difficult of proof or disproof. Assuming the standard of medical certification to have remained the same, or even to have improved, the material question remains whether it has been found adequate to afford the requisite check against an increased tendency of insured persons to claim when they could not properly be regarded as incapable of work. Patients cannot, it is said, be held responsible for the estimates of their own incapacity, except in the rare cases in which they seek to deceive.

REFERENCES TO THE REGIONAL MEDICAL STAFF.

Analysis of all ordinary references to the regional medical staff in England and Wales in the year 1929 shows that 53 per cent. of those referred ceased to draw benefit after being notified of the reference. Of those referred:

(*a*) Over 14 per cent. received a final certificate from the practitioner in attendance—usually on the day on which the notice of reference was received or the following day.

(*b*) There were 19 per cent. who, not having received a final certificate on one of those days, did not attend for examination when summoned, and ceased to draw benefit.

(*c*) Over 19 per cent., having been examined by an examining officer of the department, were found to be in his opinion not incapable of work.

Reasons which do not lend themselves to summary are given for the view that the proportion of persons referred who cease benefit after the practitioner and insured person have received notice of reference is much greater than could be explained by the two considerations of (i) the lapse of time between the date of the last certificate of incapacity issued prior to reference and the date on which, after reference, the insured person ceases to draw benefit, and (ii) legitimate differences of medical opinion respecting those who are examined by examining officers of the regional medical staff.

Further evidence as to the proportion of persons receiving benefit who are not incapacitated for work is derived from consideration of the facts (*a*) that among the four classes of insured persons—men, single women, married women of 45 and under, and married women of 46 and over—the classes which show the greatest increase of claims from 1921 to 1927 are also the classes in which the highest proportion is now found of persons who cease to draw benefit after reference, and (*b*) that the great increase which has occurred during the years 1922 to 1930 in the number of references by societies to the regional medical staff has not been accompanied by the increase which might have been expected in the proportion of those referred who continued to draw benefit.

Comparative study of the results of references of patients of different practitioners is regarded as confirming this general view, since the differences in these results, in respect of large numbers of insured persons and practitioners, are inconsistent with the supposition that they are explicable by the two factors of lapse of time and differences of medical opinion, already mentioned. The divergences are in fact so wide as to point to the conclusion that a considerable number of certificates of incapacity have been issued which were not justified by the condition of the patient at the time of issue.

EXPLANATIONS BY PRACTITIONERS.

During the latter part of 1930 regional medical officers, it is stated, interviewed a number of practitioners in different parts of the country whose results of reference compared unfavourably with those of their colleagues practising in the same area. Some of the explanations given are regarded as confirming impressions gained otherwise of the attitude of a not inconsiderable number of practitioners towards certification.

(*a*) A substantial proportion of the practitioners interviewed stated that they found themselves unable to certify strictly in accordance with their medical judgment for fear of losing patients.

(*b*) Some said that when their patients complained of illness and inability to work they did not feel justified, even in the absence of any signs of disease, in refusing certificates.

(*c*) Some stated that, although they might believe a patient to have recovered and become able to resume work, they preferred to leave the duty of saying so to the examining officer of the department.

(*d*) Finally, it was not infrequently said that, although a patient might legitimately be considered to be not incapable of work, the doctor knew how difficult it would be for that patient to find work under the prevailing conditions of employment, and he allowed himself to be influenced by compassionate considerations in the direction of continuing to issue certificates.

Such statements, offered in explanation of the high proportion of insured persons on the list of these practitioners who when referred ceased benefit, support the general inference that, in cases sufficiently numerous to have an appreciable effect on the benefit funds, certificates are issued which are not in accordance with the doctor's considered opinion of his patient's capacity for work, but are based either on insufficient evidence of incapacity or on considerations irrelevant to the insured person's title to benefit.

Medical Responsibility.

It is nowhere suggested in the memorandum that insurance practitioners as a whole have been responsible for the increase of claims. The strongest evidence adduced respecting the issue of certificates of incapacity to persons who were not incapacitated is that derived from a comparison of the results of the work of different practitioners. In other words, the standard by which some are judged to have failed to exercise proper care in their issue of certificates is that afforded by comparison of the results of their work with that of their colleagues. It is also clear (the memorandum states) that a considerable proportion of errors in certification are not due solely, mainly or even in some instances at all, to such failings as lead also to errors of treatment, but to failure to appreciate the nature and organisation of national health insurance. Whatever the sources of error however, it is evident that payments of benefit to insured persons when not incapable of work are sufficiently widespread, to call for special efforts by all concerned with a view to the better protection of the benefit funds.

Complaints, it is stated (Circular A.S. 278), are still received by the central departments to the effect

(*Continued at foot of opposite page.*)

SPECIAL ARTICLES

GENERAL MEDICAL COUNCIL.

SUMMER SESSION, JUNE 2ND–5TH, 1931.

Penal Cases Reported by the Dental Board.

The Case of John Forbes McDonald Connar, registered as of 28, Queen-street, Belfast, dentist 1921, who had appeared before the Board on May 13th, 1931. The following facts were then established by the evidence :—

In September, 1930, Mr. George Brannigan, a member of the Royal Liver Friendly Society (National Health Section), wishing dental treatment, called upon one Walter R. Bamford, a dental mechanic, who gave him advice and told him to get a dental letter from his approved society. A week later Mr. Brannigan called again on Mr. Bamford with the dental letter, on which occasion Mr. Connar was also present and both examined Mr. Brannigan's mouth. Shortly afterwards Mr. Connar and Mr. Bamford made two calls on Mr. Brannigan, and on the first call Mr. Connar gave cocaine and Mr. Bamford extracted some teeth, and on the second occasion they did the same thing, except that Mr. Connar also extracted a tooth. Later, Mr. Bamford called twice on Mr. Brannigan and took impressions for the denture, and Mr. Brannigan signed the dental letter which had already been signed by Mr. Connar. Mr. Connar drew the money, £3 6*s.* 3*d.*, from the approved society. Mr. Connar rented a surgery in Mr. Bamford's premises for which he agreed to pay 2*s.* 6*d.* a week, but in fact paid by supplying Mr. Bamford with dental materials to the amount of about £5. Mr. Connar occupied this surgery from July to December, 1930. Mr. Bamford was not a registered dentist and in respect of the facts above mentioned was prosecuted by the Dental Board at Belfast on March 3rd, 1931, pleaded guilty, and was convicted and fined £10 and 20*s.* costs for practising, and 20*s.* and 20*s.* costs for holding out.

The Board found that Mr. Connar had enabled Mr. Bamford to practise as if he were registered, and recommended that his name be erased.

Mr. Connar did not appear before the Council and was not represented. Mr. Harper read a letter from him. After deliberation in camera, the President announced that the Registrar had been directed to remove Mr. Connar's name from the Register.

The Case of Thomas James Willis, registered as of 120, Abbots-road, Cheam, Surrey, dentist 1921. At the inquiry held on May 12th, 1931, the following facts were established by the evidence :—

That Mrs. Goodwin first became acquainted with the said Thomas James Willis in November, 1929, when he was attending her as her dentist. That the said Thomas James Willis committed adultery with Mrs. Goodwin on June 14th, 1930, and June 15th, 1930, and since. They have lived together at Seven Kings, Essex, and at Cheam, Surrey, and are living together now.

The Board recommended that Mr. Willis's name be erased from the Register.

Mr. Willis did not appear and was not represented. The Council directed the Registrar to erase his name from the Dentists' Register.

The Case of Ernest Harold Christopher Bailey, registered (on the Colonial list) as of Harvard House, 11, Collins-street East, Melbourne, C1, Cert. of Qual., 1897 (*cum curriculo*), Sec. 54, Medical Act, 1890 (Victoria).

Mr. Bailey, who is in Australia, did not attend in answer to his notice, nor was he represented at the inquiry held on May 12th, 1931, but his solicitor had written a letter asking for an adjournment. He asked "that this matter be allowed to stand over pending an amendment of the Dental Act which is being brought before Parliament by the Dental Board—i.e., of Victoria—to meet the circumstances of this case." As it was a case of conviction in respect of the receiving of stolen goods, the Board were unable to appreciate how any amendment of the Dental Act could affect the question, and decided to hear the case. The following facts were established by the evidence :—

Mr. Bailey was convicted on Nov. 15th, 1928, at the sittings of the Supreme Court of Victoria held at Melbourne of the following felony—namely, of receiving a number of lathes and an engine, the property of Amalgamated Dental Company, knowing the same to have been stolen, and had been released on entering into a bond for £100 to be of good behaviour for a period of three years, and to come up for sentence when called upon. At the trial Mr. Bailey was defended by Mr. Brennan, K.C., and Mr. Barry. The judge on binding him over said : "In the witness-box the most damning evidence against you was given by yourself. . . . I realise that this is not a case of a man who is known to thieves as a receiver of stolen property. I think that justice will be done if I order that you come up for sentence when called upon."

Mr. Bailey's name had been erased from the Dentists Register of Victoria in consequence of the conviction, and the Board recommended its erasure from the Register of this country.

The President read the section of the Act relevant to cases of dentists convicted of felony in any part of His Majesty's dominions. After deliberation in camera the President announced that Mr. Bailey's name would be erased from the Register.

The Case of James Brown Gibson, registered as of 4, Killermont-street, Glasgow, dentist 1921. At the inquiry held by the Board on May 14th, 1931, the following facts were established by the evidence :—

That on July 14th, 1930, at the Sheriff Court, Glasgow, after a plea of guilty, the said James Brown Gibson was convicted of uttering as genuine a dental letter after forging the signature of the patient (one John M. Henderson) thereto and of attempting to obtain by fraud payment thereon from the Scottish Typographical Association and was sentenced to a fine of £10 or 60 days' imprisonment.

Mr. Gibson was not present and was not represented. Mr. Harper read a letter from his solicitor. After deliberation in camera, the President announced that the Council had directed the Registrar to erase his name from the Register.

Penal Cases Adjourned from Previous Sessions.

The Case of James Gordon Bell, M.C., registered as of Ballochmoyle House, Dunfermline, L.R.C.P.Edin. 1914, L.R.C.S. Edin. 1914, L.R.F.P.S. Glasg. 1914, M.B., Ch.B. 1914, U.Edin., who had been summoned to appear before the Council on charges of having been convicted of negligent driving and drunkenness. At the November session, 1930, the facts had been found proved to the satisfaction of the Council, but judgment had been postponed for six months.

Dr. Bell appeared in answer to his notice. He stated that he had been in a sanatorium, and that his health had greatly improved. He proposed to abstain altogether from alcohol in the future, and had prospects of employment from July next. He produced testi[illegible] character.

(*Continued from previous page.*)

that improper statements made by local agents and visitors, regarding a member's right to sickness or disablement benefit, embarrass medical practitioners in dealing with insured persons. Societies are enjoined to impress on their agents the need for careful use of words in explaining to insured persons their right to benefits, so that it may be clear to them that certificates can only be issued by a doctor if, in his opinion, the insured person is really incapable of work.

The President announced that the Council had postponed judgment for another 12 months, at the end of which time Dr. Bell would be expected to appear again and to produce testimonials to his character and habits.

The Case of James Rutherford Ratcliffe, registered as of 1, Grange-street, Port Talbot, Glam., M.B., C.M. 1897, U.Glasg., who had been summoned to appear before the Council on charges of conviction for drunkenness. The convictions had been found proved at the November session of the Council, but judgment had been postponed for six months.

Mr. Ratcliffe was accompanied by Mr. A. A. Pereira, instructed by Messrs. Le Brasseur and Oakley, representing the London and Counties Medical Protection Society. He produced two strong testimonials to his character and, through his counsel, repeated his expressions of regret and his promise to abstain from alcohol in the future. After deliberation in camera, the President announced that the Council had not seen fit to direct the erasure of Mr. Ratcliffe's name.

The Case of Simeon Moses Cohen, registered as of 1, Ynyswen-road, Treorchy, Glam., M.R.C.S. Eng. 1919, L.R.C.P. Lond. 1919, who had been summoned to appear before the Council on the following charge :—

> "That, being a registered medical practitioner, you on March 15th, 1930, issued the following certificate, viz. :—
>
> 'The Surgery, Treorchy.
> 15.3.1930.
>
> 'I certify that W. King is unable to follow his employment since 15/3/30 owing to illness.
> S. M. COHEN, Surgeon.'
>
> whereas you had not seen or examined the said W. King on March 15th, 1930, which certificate was misleading and improper."

At the November session the charge had been found proved to the satisfaction of the Council, but judgment had been postponed for six months.

Mr. Cohen appeared, and was accompanied by Mr. Oswald Hempson, of Messrs. Hempsons, representing the Medical Defence Union. He produced testimonials to character, and gave assurances as to his future conduct. After deliberation in camera, the President announced that the Council had decided not to erase Mr. Cohen's name from the Register.

The Case of Percy Bateman, registered as of 423, New Cross-road, London, S.E. 14, L.R.C.P. & S. Edin. 1906, L.R.F.P.S. Glasg. 1906, who had been summoned to appear before the Council on the following charge :—

> "That you were on April 2nd, 1930, convicted at the Woolwich Police-court of the following misdemeanour, —namely, of being drunk, and were fined 5*s.* or five days' imprisonment."

The charge had been found proved at the summer session, 1930, but judgment had been postponed for 12 months.

Mr. Bateman appeared and presented testimonials to character. Mrs. Bateman gave evidence that her husband had entirely given up alcohol since entering a home for treatment, and that he was now in practice, doing light work in partnership. He was living in the country, and coming up to town to work daily. Mr. Bateman gave assurances of his intention to abstain from alcohol in future, and explained his present work and habits. After deliberation in camera, the President announced that the Council had decided that Mr. Bateman's name should not be erased from the Register, but that he should be given what the President described as a final chance.

New Penal Cases.

The Case of George Francis Donaldson Perrott, registered as of 46, Belmont-road, Uxbridge, Middlesex, M.R.C.S. Eng. 1928, L.R.C.P. Lond. 1928, who had been summoned to appear before the Council on the following charge :—

> "That you were convicted of the following misdemeanours, viz. : (1). On June 16th, 1930, at the Westminster Police-court, of being drunk while in charge of a motor-car, and were fined £25 and £6 6*s.* costs, eight weeks' imprisonment in default, and your licence endorsed and forfeited for 12 months ; and (2) on March 7th, 1931, at the Bournemouth Police-court, of being under the influence of drink to such an extent as to be incapable of having proper control of a motor-car of which you were the driver, and were fined £30 and £1 16*s.* 6*d.* witness fees, or three months' imprisonment in default, and were disqualified for holding a licence for 12 months."

Mr. Perrott attended and addressed the Council, promising to abstain from alcohol in future. After deliberation in camera, the President announced that judgment would be postponed for 12 months.

THE NEWELL TREATMENT FOR TUBERCULOSIS.

The Case of Herbert Castlemain Hocken, registered as c/o E. Peet, LL.D., 11, Fetter-lane, E.C. 4, L.S.A. Lond. 1901, who had been summoned to appear before the Council on the following charge :—

> "That, being a registered medical practitioner, you have sought to attract to yourself patients and to promote your own professional advantage (1) by being associated with or employed by an individual and/or firm who, to your knowledge, sought to attract patients by advertising and canvassing through the medium of articles appearing in the *Daily Sketch* relating to an alleged cure for tuberculosis known as the 'Newell Treatment'; (2) by accepting persons as patients who to your knowledge had come to you as the direct result of the said articles ; (3) by seeking to induce registered medical practitioners to use in the treatment of their patients and to make themselves responsible for a medicament of whose properties and action such practitioners were not fully informed. And that in relation thereto you have been guilty of infamous conduct in a professional respect."

The complainants were the Medical Defence Union.

Mr. Hocken was accompanied by Mr. Harold Bevir, solicitor, who applied for an adjournment on the ground that an application was being made to the High Court to ascertain whether Mr. Hocken was amenable to the jurisdiction of the Council. This application was not acceded to.

Mr. Hempson, representing the Medical Defence Union, stressed the fact that the charge was *one* of association with a concern that was advertised, and with a medicament of the properties and action of which practitioners were not fully informed. There was no discussion of the value of the treatment. He referred to a series of articles in the *Daily Sketch* in December last and read extracts. The articles extolled the Newell form of treatment for tuberculosis and declared that medical etiquette was preventing public access to it. He recalled the case of Dr. S. Hooker,[1] whose name had been erased for similar conduct, and whose case constituted a clear warning to others. This case was an absolute replica. The articles claimed that the Newell treatment had never been advertised, but they constituted in themselves an advertisement of incalculable value. As evidence that Dr. Hocken was aware of this campaign, and prepared to avail himself of it, Mr. Hempson read a circular letter sent by Dr. Hocken to members of the profession. It set out his attainments in a manner more likely to appeal to the laity than to the profession, and was accompanied by testimonials and terms. The fee of two guineas was payable in advance. The technique-directions were signed by the unqualified Mr. Newell, and not by Dr. Hocken. A second document, signed by O. A. Newell, constituted a reply to letters written in consequence of the *Daily Sketch* appeal. It concluded that patients not under a doctor or those who experienced any difficulty in obtaining the treatment could be arranged for in London. When Mr. Whitwell had written to Dr. Hocken, posing as a patient who had seen the articles in the *Daily Sketch*, he had received a reply making an appointment. At the interview he had been welcomed as a patient coming through the *Daily Sketch*, and had been offered treatment at one guinea an injection, and had been given documents testifying to the efficacy of the treatment. The telephone number was the same as that of Mr. Newell, who was described in the telephone directory as "Dr." O. A. Newell.

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[1] THE LANCET, 1925, ii., 1192.

Dr. James Neal testified to the communications he had received from members of the Medical Defence Union about the Newell treatment, the *Daily Sketch* articles, and pamphlets about it. He gave it as his opinion that the alleged "full disclosure" of the constituents of the Newell treatment was insufficient to justify a medical man in administering it. In cross-examination by Mr. Bevir, he said that he thought it would be gravely unprofessional of any doctor to use it without further knowledge. He had drawn the attention of the Medical Defence Union to the matter on the third Thursday in February. He had made no personal investigation, and had not sent any warning to Dr. Hocken. He agreed that Dr. Hocken was not mentioned in the *Daily Sketch* articles by name, but said that they implied that some doctor would treat patients. He could not regard the articles as a poor form of advertisement, even if no name, address, photograph, or interview appeared. The effect of the articles was to induce sufferers from tuberculosis to apply to the laboratory for treatment. The medical superintendent of the laboratory was Dr. Hocken, and Dr. Hocken replied to letters addressed there. He could not produce witnesses—other than Mr. Whitwell—who had been to Dr. Hocken as a result of the articles. He was not accusing Dr. Hocken of being concerned in inspiring the articles, but it was obvious to him that the respondent had derived benefit from them. They were all publicity for the Newell alleged treatment for tuberculosis.

Mr. F. D. Whitwell, clerk to Messrs. Hempsons, testified to his correspondence and interview with Dr. Hocken. Dr. Hocken had handed him a circular letter and a pamphlet on which Dr. Hocken was described as medical superintendent. He had been told that a month's supply of treatment would cost two guineas, and that he would need two injections a week for some weeks, according to progress, each injection to cost £1. Dr. Hocken had made no examination of him to see whether or not he was a suitable patient, nor had he inquired the name of witness's doctor.

Cross-examined by Mr. Bevir, he said that Dr. Hocken had read to him the names of three patients whom he had treated. He had not made any note of the names. He paid no fee at that interview, but was told to come again on the next Monday with £3 2s.

In reply to the President, he repeated that Dr. Hocken had made no examination of any kind whatever, but that he had assumed that he would be examined on the Monday, when he returned with the fee.

Mr. Bevir characterised the evidence of the complainants as flimsy and third- or fourth-hand, consisting of a bundle of newspapers. The charge might have been against the *Daily Sketch* or Mr. Newell, but the articles and documents hardly involved Dr. Hocken at all. Stronger evidence was required for a sentence involving professional ruin. The only relevant evidence was that Dr. Hocken's name had appeared as medical superintendent. Desire for gain or payment could not be alleged against him. Mr. Whitwell was a spurious patient, and an agent provocateur; the evidence of such persons was rejected in English courts if any other evidence could be obtained. Even that witness had not succeeded in obtaining evidence that Dr. Hocken was receiving fees, or had ever sought to attract patients. He had advised Dr. Hocken that there was no case for him to answer, and that it was therefore unnecessary for him to go into the box and explain the circumstances of his practice. Dr. Hocken was an apothecary, and an apothecary was entitled by law to sell medicines.

The Council found the first two charges proved and the third not proved, and directed that Mr. Hocken's name be erased from the Register.

PARTNERSHIP WITH A DENTIST.

The Case of Robert Miller, registered as of 77, Constitution-road, Dundee, M.B., C.M., 1889, U.Glasg., summoned to appear before the Council on the following charge:—

(1) That, being a registered medical practitioner, and as such to your knowledge not entitled to receive fees or payment from approved societies for dental treatment to members of such approved societies, you entered into partnership with one R. Whyte, L.D.S., of 9, King-street, Dundee, a registered dentist, for the purpose of using his name and thereby obtaining fees or a proportion of the fees payable by approved societies, in accordance with schemes sanctioned by the Ministry of Health under the National Health Insurance Act, 1924, for dental treatment, to registered dentists only;

(2) That in furtherance of such partnership and purpose you caused the signature of R. Whyte to be affixed to a dental letter by means of a rubber stamp in respect of one Mrs. May A. Lyons, a patient of yours and a member of The Dunkeld Diocesan Catholic Insurance Society, being an approved society, thereby falsely and in breach of the conditions of the scheme for dental benefit representing to such society that the said R. Whyte had personally examined the said Mrs. Lyons and made an estimate for her dental treatment, when in fact, as you well knew, the said R. Whyte had not personally seen or examined the said Mrs. Lyons.

And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect.

Dr. Miller appeared, accompanied by Mr. A. A. Pereira, instructed by Messrs. Le Brasseur and Oakley. The complainants, the Dental Benefit Council, were represented by Mr. J. Scott Henderson, instructed by Messrs. Ponsford and Devenish.

Mr. Henderson, in opening the case, explained that Dr. Miller, though as a registered medical practitioner entitled to practise dentistry, had no qualification that would entitle him to have his name on the Dental Register. Dental benefit was an "additional benefit" under the National Health Insurance Act, 1924. The Department of Health for Scotland had sanctioned this additional benefit in the case, among other approved societies, of the Dunkeld Diocesan. One of the conditions was that the treatment must be given by a registered dentist. This fact might, he said, supply a motive for the alleged offence. Under the partnership agreement between Dr. Miller and Mr. Whyte, Dr. Miller received two-thirds of the fees paid to Mr. Whyte. The treatment of Mrs. Lyons was estimated in the "dental letter" to be £6 5s., of which the society were to contribute £3 5s. When a panel patient had come with a dental letter, Dr. Miller had been in the habit of examining the patient himself to see what treatment was required; he had filled up the letter, stamped it with Mr. Whyte's name, and sent it in to the society, and when it came back, had handed it over to Mr. Whyte at 9, King-street, and in due course had sent the patient there for treatment. This estimation and report on behalf of another practitioner was, Mr. Henderson submitted, improper conduct. Mr. Whyte had never seen Mrs. Lyons, and Dr. Miller had claimed 2*s.* 6*d.* from the society as from Mr. Whyte, of 77, Constitution-road, his own address.

Mr. Edmund William Handcock, Secretary in Scotland of the Dental Benefit Council, formally testified to the facts as far as they had come within his knowledge.

Mr. Robert Whyte stated that Dr. Miller had estimated straightforward cases but had sent difficult ones, or patients who had especially desired it, to him. He had found Mrs. Lyons's letter in a drawer. Dr. Miller had said that this patient would probably not return for treatment, so he had signed the form G and given it to Dr. Miller.

Cross-examined, he admitted that he had known that Dr. Miller had used his stamp in cases which he (witness) had not examined. He had asked respondent not to do so, but he had insisted that he was entitled to, and witness had taken no steps because he was dependent on Dr. Miller for everything. Witness admitted that the question of Dr. Miller's procedure had only been raised by small local societies, and not by any large society. He had been licensed in dentistry two or three months before taking up his work with Dr. Miller. The bulk of his patients had been insurance patients coming to him through Dr. Miller. He had never been in Dundee before.

In answer to the Legal Assessor, he said that the cheques from the approved society were made out in his name, endorsed by him, and handed to Dr. Miller for his private account. Witness received one-third of those fees monthly, under their agreement. The patients were Dr. Miller's patients sent to witness for treatment. The forms headed "This should be handed to any registered dentist," were never handed to him by Dr. Miller's patients but went to Dr. Miller.

Mr. H. S. Herbert gave evidence describing the procedure of the Dental Benefit Council.

Dr. Miller, in the witness-box, said that he had practised in Dundee since qualifying in 1889 and had always practised dentistry. He could have qualified under the Dental Act, 1921, if he had been carrying on dentistry as his principal means of livelihood. He had attended insured patients requiring dental treatment until 1926, when his attention had been drawn to the fact that the schemes for dental benefit approved by the Minister stated that treatment must be obtained from a registered dentist. He had then written to various authorities for a ruling and had discontinued dental treatment. When he had entered into partnership with Mr. Whyte he had assumed that it would be in order for him to examine a patient and fill in an estimate, so long as the actual work in the mouth was carried out by his partner. He had a bona fide belief that he was entitled to act as he had done. The partnership had never been concealed. The two names had appeared on the brass plate and on the account forms, and every local agent of the approved societies was aware of it. He had assumed that, having a registered dental partner, he could act for him. The papers would go back, when filled in, to the central society, which would not know that the patient had been examined by him and not by the registered dentist whose name was stamped on them. He had never had a stamp of his own marked "surgeon dentist" because he thought it fairer for the junior partner to be on his own.

In reply to the President he said Mr. Whyte's stamp had been made soon after Mr. Whyte's appointment, he had had it made because Mr. Whyte's name was on the Dental Register, and neither his own name nor that of the partnership would pass on these documents. He would never sign another man's name, but did not regard it as wrong to use his stamp, even to the statement: "I have examined . . ." The stamp belonged to his partner, who—if he did not know at the time—knew afterwards. One object of the partnership had certainly been that he might claim dental benefits to which he was not entitled on his own qualifications.

Mr. Pereira said that Dr. Miller had believed himself entitled to examine the mouths of patients, and had not done any dental work himself. The signature was one of "authority by inference," since Mr. Whyte had known that his stamp was used. Dr. Miller had honestly thought his action correct.

Mr. Henderson maintained that the use of the rubber stamp in this way was likely to deceive the companies.

After deliberation in camera, the President announced that the Council had found the charges proved, but in view of Dr. Miller's age and long experience of dental work before the new Act, and the possibility of bona fide misunderstanding, they had decided not to direct the Registrar to erase his name from the Register.

CHARGES OF IMPROPER CERTIFICATION.

The Case of William Allan, registered as of 9, Margaret-street, Greenock, M.B., Ch.M., 1895, M.D. Glasg., 1898, who had been summoned to attend before the Council on the following charge:—

That being a registered medical practitioner you, on April 9th, 1929, and on various dates subsequent thereto during the period to August 29th, 1930, signed and issued to Duncan McAlpine, an insured person on your list, 42 certificates required for national health insurance purposes, stating that you had examined him on the several dates stated thereon, whereas you had not examined the said insured person on any of such dates or at all during the said period, which certificates were untrue, misleading, or improper.

And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect.

The complainants were the Department of Health for Scotland.

Dr. Allan attended and admitted the facts as alleged. Mr. D. Gerrand, representing the Department of Health, laid the facts before the Council and handed in the certificates in question. Dr. Allan explained that he had known the patient for about 20 years; he was being treated for a disfiguring tuberculide which made him extremely sensitive. He was genuinely ill and Dr. Allan had wished to save him the mental anguish of attending the surgery for certificates.

After a long deliberation in camera the President announced that the Council had found the facts proved, and regarded the matter as one deserving grave censure. They were, however, prepared to believe that Dr. Allan had acted from an error of judgment and a mistaken view of duty, and dismissed the case.

The Case of Thomas Joseph McKaigney, registered as of 24, Kelvinside-gardens, Glasgow, L.R.C.P. & S. Edin., 1902, L.R.F.P.S. Glasg., 1902, who had been summoned to attend before the Council on the following charge :—

That being a registered medical practitioner you, by yourself or your deputies, on August 17th, 24th, and 31st, 1929, and Sept. 7th, 14th, 21st, and 28th, 1929, issued to Annie Kelly, an insured person on your list, certificates required for national health insurance purposes certifying that the said insured person had been examined on those dates, whereas the said insured person had not been examined on any of such dates or at all during the said period, which certificates were untrue, misleading, or improper.

And that in relation to the facts so alleged you have been guilty of infamous or disgraceful conduct in a professional respect.

The complainants were the Department of Health for Scotland.

Dr. McKaigney was accompanied by Mr. Oswald Hempson, solicitor, representing the Medical Defence Union. Mr. D. Gerrand, for the Scottish Department of Health, handed in the certificates referred to, and read the findings of the departmental committee.

Mr. Hempson submitted that there was no evidence for the Council to consider. Mr. Gerrand said that his instructions were merely to lay the documents before the Council. Dr. McKaigney had had the opportunity of defending himself before the committee but had not done so.

Mr. Harper, reading from the report of the subcommittee, stated that Annie Kelly had applied for benefit on another occasion and had been told that she was not entitled to it because she had previously drawn it while at work. It had then been discovered that her aunt, Mrs. Griffin, had been drawing her benefit money in her place on certificates obtained from respondent; for this offence she had been imprisoned.

The certificates were exhibited to the Council. They stated the causes of incapacity as chlorosis and anæmia, and a later one as chlorosis and gastritis.

Mr. Hempson objected that the report of this subcommittee, with the statements of witnesses who had not been cross-examined, could not constitute evidence, but the President ruled that the Council could consider it.

Mr. Hempson then called Dr. McKaigney as a witness on his own behalf, and he testified that he could only recollect having seen Annie Kelly the first time, but that his invariable practice was never to give a certificate without examination.

Dr. Bone inquired why the panel cards, which constituted a permanent record, had not been produced by the Department.

Mr. Hempson addressed the Council, again pointing out the inadequacy of the evidence, and submitted evidence of his client's good character.

After deliberation in camera, the President announced that the Council had not found the charges proved to their satisfaction.

The Case of Archibald Carmichael Young, registered as of 9, Eyre-place, Edinburgh, L.R.C.P. and S. Edin., 1925, L.R.F.P.S. Glasg., 1917, who had been summoned to attend before the Council on the following charge :—

(1) That being a registered medical practitioner you, on April 8th, May 8th, and June 7th, 1930, signed and issued to Donald Chisholm, an insured person on your list, certificates required for national health insurance purposes, stating that you had examined him on the several dates stated thereon, whereas you had not examined the said insured person on any of such dates, which certificates were untrue, misleading, or improper.

(2) That being a registered medical practitioner you, on July 8th, August 8th, and Sept. 2nd, 1930, directed or permitted to be issued to the said Donald Chisholm similar certificates by your assistant, J. S. Miller, whereas neither you nor the said J. S. Miller had examined the said insured person on any of such dates, which certificates were untrue, misleading, or improper.

And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect.

The complainants were the Department of Health for Scotland.

Dr. Young was accompanied by Mr. S. Henn Collins, instructed by Messrs. McKenna and Co. Mr. Gerrand, representing the Department of Health, produced the certificates in question, the report of the subcommittee, and a letter from the respondent.

Mr. Harper, reading the report of the subcommittee, stated that in this case the certificates had been handed regularly to a messenger who called at the surgery every month. The respondent admitted giving certificates without seeing the patient. He had gone to the patient's house during the material period, but had failed to obtain admission. The patient had been seen on some date in June and again in October and November. Dr. Young's letter to the Department of Health stated that the patient had been incurable, suffering from encephalitis lethargica. The patient had refused to admit respondent to the house although respondent had made repeated and regular efforts to see him, and had tried to obtain admission for the patient into two hospitals, without success.

Mr. Henn Collins admitted, for respondent, that he had signed certificates without actually seeing the patient, but contended that, under the circumstances, they had not been untrue, misleading, or improper, and that their issue did not amount to infamous conduct.

After deliberation in camera the President said that the Council had found the facts in the first charge against the respondent proved; that they regarded the offence as one worthy of grave censure, but that, in view of the circumstances—although these did not constitute an excuse for respondent's laxity—they considered that he had acted from a mistaken view of his functions and an error of judgment due to good nature. They therefore did not find him guilty of infamous conduct, and dismissed the case.

A FORGED DOCUMENT.

The Case of Thomas Benjamin Brandon, registered on the Colonial List as of 605, Stretford-road, Stretford, Manchester, M.C.P. and S. Manitoba, 1915, M.D. U. Manitoba, 1917, who had been summoned to appear before the Council on the following charge :—

That at the Manchester Assizes commencing on Feb. 16th, 1931, you were convicted of unlawfully uttering a forged public document, and were sentenced to three months' imprisonment in the second division.

Dr. Brandon did not appear and was not represented.

Mr. Harper explained the circumstances of the case and read extracts from the newspaper reports of the trial. Respondent had desired to stand for Parliament and had handed in nomination papers bearing forged signatures. His moral character had been severely impugned by credible witnesses.

The Council found the charges proved, and directed that Dr. Brandon's name be erased from the Register.

This concluded the hearing of disciplinary cases, the case against John Roberts Pate, registered as of 37, Beaumont-street, Oxford, M.B., Ch.B. 1915, U. Glasg., having been dismissed as the charge against him was not proved to the satisfaction of the Council.

A DRESSMAKER'S WARD.—The dressmakers in the neighbourhood of the Middlesex Hospital purpose building a ward in that institution. Towards the £25,000, which the ward will cost, £5000 has already been raised.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

MENTAL EFFICIENCY AND DEFICIENCY.

AT a recent Glasgow conference of the Scottish Association for Mental Welfare, Dr. Parlane Kinloch, chief medical officer of the Department of Health for Scotland, pleaded for a return to the Greek ideal of healthy youth. He would like to see a great experiment made in schools with two sets of children coming from the same social circumstances. In one of them the children would receive instruction for an hour at a time, alternating with an hour's physical exercise and outdoor recreation. He would not be surprised if in four or five years these children who had rhythm in their school lives between mental and physical work, would be more efficient mentally than the children who had been confined to the steady six hours of educational work.

Dr. R. D. Clarkson, of Larbert, maintained that injury to the brain at birth is a common cause of mental defect. Many of them could be prevented if antenatal care was recognised as always necessary, and if the standard of education of medical men and midwives was raised. He expressed his well-known doubts about the limits of heredity in mental defect. Dr. R. M. Marshall said that in the ascertainment of imbeciles the test of inability to be taught to manage themselves or their own affairs was not very satisfactory, and that in the higher grades of the condition the crucial test of a trial in the special classes for at least a year was always indicated. In the ascertainment of feeble-minded persons the criterion should be incapacity to receive proper benefit from instruction in the ordinary classes; at school age the question of social adaptability should only be considered when it was raised by the conduct of the individual.

Dr. David Yellowlees said he took it to be one of the objects of the association to create a public conscience in matters of mental diet, especially that offered to children whose selective powers were not yet developed. They could hardly feel complacent if they considered the quality of the cheap reading matter and films provided for children at the present time. Much of that material tended to present to immature minds aspects of life and ideas about life which were terribly false, one-sided, and cheap.

MENTAL DISEASES RESEARCH.

At a meeting of the University Court of the University of Edinburgh, it was reported that Dr. Walter Smith Kay, who died on April 22nd, had bequeathed to the University the sum of £5000 subject to Government duty, the annual income to be applied towards aiding research in mental diseases and psychiatry in such manner as the Court, together with the Professor of Psychiatry, shall think fit.

NURSERY SCHOOLS.

There is, I gather, a good deal of discord between the education committees and the public health committees of the new local authorities about the provision and the superintendence of nursery schools. Under the Notification of Births Acts, health authorities have power to set up such schools, including kindergartens, toddlers' playgrounds, &c., and the Education Act, 1918, empowers the education authorities to provide nursery schools. The powers of the two Acts are leading to some confusion. There is a general wish that the health of children from birth to the end of their school age should be under a united direction; but, obviously, the members of the former education authorities, who have been largely coöpted on to the new education committees, find difficulty in agreeing either with the town council or with the county council members. It will be several years before the counties master their new duties and, meanwhile, as the tendency will be to economise, we may expect a considerable reaction in the work of school health administration. In the south of Scotland, however, there have, as yet, been few indications of such a reaction, and ultimately the unification of the system will bear fruit.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

A SWEEPSTAKE WRANGLE.

A SOMEWHAT sharp debate took place in the Dáil last week over the distribution of the proceeds of future sweepstakes between the voluntary hospitals and the county (rate-supported) hospitals. The Minister had proposed that a quarter of the available funds should be allocated to the county hospitals, and an amendment had been moved to increase the proportion to half. Much of the debate centred about the irrelevant question of the respective merits *of the two classes of institution.* It should be clear to anyone who gives thought to the subject that the county hospitals and the voluntary hospitals should work in coöperation and not in rivalry. A certain improvement in the county hospitals in recent years has, however, led many people to think that these institutions can supply a complete hospital service to the country. The staff of a county hospital consists in most cases of one or two men—a surgeon, or a surgeon and a physician, who also acts as anaesthetist. The surgeon may be provided with an X ray apparatus, but he must be his own expert. He is not provided with any pathological assistance, nor has he the help—except in a few institutions—of any further specialists. It is clear that such a staff cannot deal with more than a limited class of case, and in a small country town an all-round staff is impossible. There will always, therefore, be a considerable number of cases which will require the investigation of a larger staff and the help of a fuller equipment than the county hospitals can provide. Such cases must find their way to the voluntary hospitals. A recognition of this simple fact would have prevented much of the futile discussion in last week's debate. It is not altogether the fault of the deputies that the fact is ignored. The Department of Local Government and Public Health has done nothing to advise local authorities as to the kind of cases that are best treated in the county hospitals, and the kind of cases that should be sent to the voluntary hospitals. The Commission on the poor-law system from which one might have expected guidance as the result of its investigations and deliberations a few years ago, evaded this question altogether. Once the proper function of each class of institution is recognised, much irrelevant but harmful criticism will cease. The proportion of distribution suggested by the Minister was carried on a division.

REFORMS IN LOCAL GOVERNMENT.

In the Senate last week Mr. Mulcahy, Minister for Local Government and Public Health, forecast certain reforms in local government for which he intends shortly to introduce legislation. At present local administration of health affairs is in the hands of county boards of health, bodies nominated by the county councils. This has led to a duplication of activities which is to be got rid of by the abolition of the boards of health. When boards of health were first suggested it was intended that they should contain not only representatives of the rating authority, but also members of the medical and nursing profession and other persons with an expert knowledge of health affairs. As they have existed, however, they have been merely subcommittees of the county councils, and there has been no justification for their separate existence. The other reform promised by the Minister is in the direction of managerial control of local administration. He intends to endow the secretary of the county council, or other similar official, with certain powers as a manager of the affairs of his council.

DUBLIN MEETING OF BRITISH MEDICAL ASSOCIATION.

The Leinster Branch of the B.M.A. has invited Prof. T. G. Moorhead, its present president, to accept nomination as president of the Association on the occasion of its meeting in Dublin in 1933. The nomination has to be confirmed by the Council and by the Representative Meeting.

Dr. Moorhead has had a distinguished career as a physician in Dublin. A graduate of Dublin University, he was appointed visiting physician to the Royal City of Dublin Hospital at an early age. He held for a short time the chair of medicine in the school of the Royal College of Surgeons in Ireland. In 1921 he was elected King's professor of materia medica and pharmacy in the School of Physic, Trinity College, and became a physician to Sir Patrick Dun's Hospital. In 1925 he vacated the chair of materia medica to become Regius professor of physic in the University of Dublin. During the war Dr. Moorhead served in the Royal Army Medical Corps in Egypt and France, holding the rank of lieutenant-colonel. He is at present president of the Royal College of Physicians of Ireland, and president of the Royal Academy of Medicine in Ireland. Prof. Moorhead may count on the loyal support of the profession and public of Dublin in his work as President of the British Medical Association.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

ARTIFICIAL PNEUMOTHORAX IN ABSCESS OF THE LUNG.

A RECENT discussion at the Société Médicale des Hôpitaux on the above subject demonstrated once again how, in medicine in general, and therapeutics in particular, black is white and white is black—according to the optical slants of different observers. André Jacquelin, in support of his advocacy of this treatment, referred to eight cases in all of which there was complete recovery and no relapse, although the observation period often ran into several years. He insisted that collapse therapy, instituted early and skilfully, is not only easy and almost painless, but also entails no risk of shock or other danger. Whereat, in the ensuing discussion, no less an authority than Sergent protested that all he had achieved from this treatment was disappointment. He had found its efficacy far from certain, and its freedom from danger a delusion since it may lead to infection of the pleural cavity with resulting pyopneumothorax. So when he did not find an abscess of the lung healing spontaneously in a month or two, he was in favour of operative interference. Rist's contribution to the debate swung the pendulum back to the point where Jacquelin had left it; Rist had seen rapid and complete recovery from abscesses of the lung after the induction of a pneumothorax which, to be effective, should, in his opinion, be induced quite early, before adhesions had had time to form. Certain other speakers followed Rist's lead in support of Jacquelin, while Bezançon raised an interesting collateral point; the patient in whom a pneumothorax has been induced is a comparatively difficult subject for operation should the surgeon have to intervene at a later stage. This consideration should be taken into account when the competing merits of an artificial pneumothorax and a more radical operation are weighed in the balance.

COLLECTION OF POLIOMYELITIS CONVALESCENT SERUM.

Not long ago the Academy of Medicine appointed a commission to study the suggestion that a stock of the serum of convalescents should be provided in anticipation of a return of acute anterior poliomyelitis in epidemic dimensions. A member of this commission, Netter, summarised the situation at a recent meeting of the Academy, presenting the conclusions to which his commission had come. It asks the Academy to endorse the two following recommendations: (1) That in anticipation of the possibility of the reappearance of this disease it would be desirable to put a sufficient supply of the serum of convalescents at the service of the medical profession. (2) That this serum should be obtained under conditions which would guarantee its potency and harmlessness. Although the conditions under which the serum is prepared would eliminate the risks of syphilis and tuberculosis, the commission is in favour of donors undergoing the Wassermann test in every case. It thinks that, with the help of hospitals, doctors, and instrument makers, and publicity in the press, a sufficient number of donors will be found for the proposed pool of serum.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

BIOMETRIC PROGNOSIS.

SOME years ago the Association of Life Insurance Directors, interested by the then recent tables of Prof. Georges Dreyer of Oxford, asked the statistical bureau to investigate the prognostic value of the Dreyer standard and to investigate further the relation of weight to longevity. The material investigated consists of 200,000 males, insured between 1887 and 1908, whose histories have been followed until 1921 or prior to termination of the policy. Dr. Louis Dublin now reports the result of this research. It is found that overweight is dangerous and that the danger increases consistently with the degree of overweight. The relation between age and weight is also important. After age 45 the excess mortality amongst overweights becomes most important. Those who are more than 25 per cent. overweight have a mortality-rate double the normal. In youth it is those who are markedly underweight who run the graver risk. Dr. Dreyer had claimed that well-organised overweights—those with long trunks, large chest girths, and ample vital capacity—are as good risks as those of average weight and build. Dr. Dublin's study showed, on the other hand, that those overweights who are short or medium in height are a better constituted class than those who are tall. Moreover, again in contradiction to Dreyer's teaching, the short overweights have a better chance when the trunk is relatively short. But in the tall overweights the conclusion is different: those with a relatively long trunk had a much lower mortality.

ANALYSIS OF SUICIDES IN NEW YORK STATE.

I have already indicated that the only observable ill-effect of the economic depression upon the death-rate in this country is seen in an increase of the suicide-rate. This conclusion, based on the experience of 1930, is confirmed in that of the first quarter of 1931. The New York State statisticians have in the meantime made an analytical study of their suicide-rate in the year 1930. They find that the increase in New York City is much greater than in the rest of the State (148 to 62), and that the increase has been mainly among men, the number rising from 1563 in 1929 to 1760 in 1930. Among women the corresponding increase was from 574 to 585. It will be observed that three times as many men as women are suicidal. This excess is found especially in the older age-groups. Over 80 years there are seven male suicides, and one female. In the younger age-groups the ratio is only 1·5 to 1.

The method most commonly selected up to 70 years of age was by poisonous gas; above that age hanging. Among men the most prevalent methods were: poisonous gas, 30 per cent.; hanging, 24 per cent.; firearms, 19 per cent. Among women we find: poisonous gas, 39 per cent.; corrosive substances, 17 per cent.; jumping from high places, 15 per cent.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. C. Ross is placed on the Retd. List with the rank of Surg. Capt.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. Temp. Col. J. D. Richmond from R.A.M.C. to be Col.

Maj. (temp. Lt.-Col.) M. O. Wilson, Maj. and Bt. Lt.-Col. (temp. Lt.-Col.) T. H. Scott, and Maj. (temp. Lt.-Col.) G. F. Rudkin to be Lt.-Cols.

Maj. A. O. Elliott to be temp. Lt.-Col.

R. C. Langford to be Lt. (on prob.), and is secd. under the provisions of Art. 213, Royal Warrant for Pay and Promotion.

ARMY RESERVE OF OFFICERS.

Capt. E. G. Foley ceases to belong to the Res. of Off. on account of ill-health.

TERRITORIAL ARMY.

Lts. R. Rutherford and O. O. Ryan to be Capts.

R. H. Robinson (late Cadet Serjt., Durham Univ. Contgt., Sen. Div., O.T.C.) to be Lt.

INDIAN MEDICAL SERVICE.

Lt.-Cols. to be Cols.: Bt. Col. R. McCarrison and W. R. J. Scroggie.

Lt.-Col. J. Cunningham retires.

DEATHS IN THE SERVICES.

Col. Sir ROBERT HAMMILL FIRTH, late R.A.M.C., who died on June 6th at the age of 72, received his medical education at University College, London, and qualified in 1879 with the M.R.C.S. Eng. In 1881 he obtained the L.R.C.P. Edin., and in the following year was elected F.R.C.S. A year later he became a surgeon in the Medical Department of the Army, and was with the Hazara Expedition of 1888 and with the Tirah Expedition of 1897–98. He was also employed in the late European War, being three times mentioned in despatches, created C.B. in 1918, and K.B.E in 1919. From 1900 to 1906 he was professor of military hygiene in the Royal Army Medical College, and had held the posts of assistant professor of hygiene at Netley and officer in charge of the School of Army Sanitation at Aldershot. He was the author (with Col. Notter) of the "Theory and Practice of Hygiene"; he was also the author of "Practical Domestic Hygiene" and "Military Hygiene," and contributed many articles to the *Journal of the Royal Army Medical Corps* on scientific subjects and medical history.

Inspector General HENRY CHARLES WOODS died at Alverstoke, in his ninety-first year, on June 3rd. He celebrated his ninetieth birthday on May 20th last, when he received a telegram of congratulation from the King. A graduate of St. Andrews, he entered the Royal Navy as surgeon in 1862, and in 1875 served in the *Serapis* during the tour of King Edward, then Prince of Wales, to India. He was promoted to staff surgeon in 1876, and two years later became medical officer of the Royal yacht. *Osborn*. In 1884 he was promoted to fleet surgeon, in 1895 deputy inspector general, and in 1895 inspector general of hospitals and fleets. He retired in 1901, when he received the C.V.O., and in the following year was made a C.B. Inspector General Woods was an honorary physician to the King.

COLONIAL APPOINTMENTS.

Dr. E. E. Henderson has been appointed Acting Professor of Anatomy in the College of Medicine at Singapore, and Dr. R. N. Brandwood has been made Government Medical Officer in the Gilbert and Ellice Islands, Western Pacific. Dr. G. B. Leicester, Assistant Medical Officer, Mental Hospital, Singapore, has been promoted to Deputy Medical Officer, and Dr. L. C. Wijesinghe, Medical Officer, Grade I, Ceylon, has been promoted to Provincial Surgeon, Ceylon.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED MAY 30TH, 1931.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 107; scarlet fever, 1315; diphtheria, 718; enteric fever, 35; pneumonia, 777; puerperal fever, 55; puerperal pyrexia, 95; cerebro-spinal fever, 48; acute poliomyelitis, 6; encephalitis lethargica, 11; relapsing fever, 1; dysentery, 17; ophthalmia neonatorum, 86. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on June 2nd–3rd was as follows:—Small-pox, 149 under treatment, 7 under observation (last week 160 and 8 respectively); scarlet fever, 1187; diphtheria, 1400; enteric fever, 10; measles, 169; whooping-cough, 410; puerperal fever, 33 (plus 13 babies); encephalitis lethargica, 193; "other diseases," 140. At St. Margaret's Hospital there were 21 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox nor enteric fever, 39 (1) from measles, 5 (2) from scarlet fever, 26 (7) from whooping-cough, 22 (4) from diphtheria, 41 (10) from diarrhœa and enteritis under two years, and 46 (6) from influenza. The figures in parentheses are those for London itself.

Only one death from meningococcal meningitis (aged 15–25) occurred in London. Seven deaths from measles were reported from South Shields, 5 each from Liverpool, Leeds, and Sunderland. Liverpool reported 4 deaths from whooping-cough, Newcastle-on-Tyne 3. Diphtheria claimed 5 victims at Liverpool. Manchester reported 6 deaths from influenza, Bristol 5, Rhondda 3.

The number of stillbirths notified during the week was 234 (corresponding to a rate of 40 per 1000 births), including 42 in London.

DEATH CLASSIFIED TO SMALL-POX.

THE death provisionally assigned to Market Bosworth R.D. was that of a man, aged 65, who was taken ill on April 30th and was diagnosed on May 1st as suffering from pneumonia. A rash appeared on May 7th, and he was admitted to the small-pox hospital the following day. Dr. Hart, medical officer at the hospital, reported that "on admission the patient was seriously ill with lobar pneumonia and that the variola rash was well marked. Owing to his age and debilitated condition the prognosis was not good. During the two next days he appeared to be holding his own, but on May 11th the pneumonia spread to the right upper lobe, his condition became worse, and he died early on May 13th." Dr. Hart further states that, in his opinion, while the small-pox lowered the patient's powers of resistance, it was a severe case of pneumonia which would have probably ended fatally without the complication of small-pox.

CORRESPONDENCE

SURGICAL TREATMENT OF DUODENAL ULCER.

To the Editor of THE LANCET.

SIR,—I must express profound disagreement with the conclusions on the surgical treatment of chronic duodenal ulcer set forth by my friend, Prof. C. A. Pannett, in your last issue (p. 1235). Prof. Pannett advocates resection of the ulcer and of a portion of the stomach, a portion that must be of considerable size in order to avoid recurrence of ulceration. I believe this advice to be unsound, dangerous, and misleading. The experience upon which it is based, it is admitted, is really too small; and if I challenge the wisdom of Prof. Pannett's opinion and practice it is because an experience almost twenty times as large as his has led me to conclusions directly in conflict with those he has drawn. Prof. Pannett chiefly discusses the relative merits of two operations only, of gastro-enterostomy and of resection. He omits consideration of gastro-duodenostomy, which, in appropriate cases, and in skilled hands, is the equal of any other method.

The mortality of gastro-enterostomy (8·5 per cent.) in his hands does not, of course, represent the risk of this operation and must be regarded as quite accidental. If patients are adequately prepared for operation by methods I have fully described elsewhere, neither this operation, nor resection for simple disease, should have a mortality higher than, if so high as, 2 per cent. Indeed, the question of mortality no longer demands serious discussion by competent surgeons. The matters which still require most earnest consideration are the indications for operation, the choice of the exact method suitable for each case, the exercise of infinite, daintiest care in every movement during operation, and a watchful interest over all patients for months after recovery from operation. Gastro-enterostomy is perhaps as safe as any abdominal operation can be. I have lost one case in my last thousand, and upon many of these cases cholecystectomy, appendicectomy, or both were simultaneously performed. When adequate care is taken the "perfect results" are over 90 per cent. The chief anxiety centres round recurrence of ulceration. This serious condition has developed in 1·84 per cent. of my cases. This is less than the incidence after resection, so far as I am able to judge. I have given some figures in support of this statement elsewhere. Prof. Pannett found three cases of recurrent ulceration in 83 cases, a higher percentage than many of us have found after the simpler operation, in far larger numbers of cases observed over longer periods. I have myself operated upon 11 cases of recurrent ulceration after resection performed by other surgeons and by myself.

Last year I spent twelve happy days with my old friends the Mayos in Rochester. I was delighted, but not in the least surprised, to find there no sympathy with subversive movements, and to learn that the views I hold as to the surgical treatment of chronic duodenal ulcer are theirs also. It is evident that those most experienced in these matters have refused to be beguiled by continental Lorelei into the pursuit of methods which are more dangerous at the moment of their application, and clearly less satisfactory in the long run.

I am, Sir, yours faithfully,
MOYNIHAN.

Portland-place, W., June 8th, 1931.

To the Editor of THE LANCET.

Mr. Pannett says the object of his paper is to record the results of his own experience, which has led him to conclude that pyloro-duodenal resection is preferable to the older and well-established operation of gastro-jejunostomy.

Let us examine the reasons he gives for this preference. They are: (1) After gastro-jejunostomy he has a mortality-rate of 8·5 per cent., whereas after pyloro-duodenal resection his mortality is 2·3 per cent. (2) The after-results of resection give him 81·5 per cent. cures; after gastro-jejunostomy only 61·5 per cent. On these figures his conclusions seem justified, but I find it as difficult to believe so able a surgeon as Mr. Pannett cannot produce something better than 8·5 per cent. mortality after gastro-enterostomy, as to understand how he can expect to get any reliable evidence regarding after-results founded upon only 51 cases. He himself admits the figures are "absurdly small," so would it not have been better to wait until he had something really impressive before attempting to make heretics of us all?

If figures must be used to prove anything let them be big, for it is only then that they *begin* to be reliable. In the *British Medical Journal* (1929, ii., 1074) Dr. A. P. Luff has reported the results of a statistical investigation on this subject based upon fairly large figures. These are his results so far as they are applicable to the present discussion. There were 995 cases of duodenal ulcer and 454 of pyloric ulcer—these are the same thing, and so we have: (1) 1449 cases of duodenal ulcer on which gastro jejunostomy was performed with a mortality rate of 4·3 per cent. (2) The after-results of gastro-jejunostomy for duodenal ulcer give 91 per cent. cures in 1064 cases followed up. These figures represent the massed achievements of many surgeons at different hospitals. I venture to predict a similarly massed result of resection for duodenal ulcer would make a poor show in comparison, even as Mr. Pannett's does, though he is an expert in this particular operation. Moreover, individual surgeons dealing with fairly large numbers of gastro-enterostomy cases can show a lower mortality-rate than that which apparently pleases Mr. Pannett in the case of his resections.

Mr. Pannett says when the ulcer was a small and soft one he did not feel justified in doing a pyloro-duodenal resection (even though he considers it a better operation than gastro-jejunostomy). I agree that resection is most certainly not necessary in this instance, though I fail to appreciate his argument, but I feel confident that if resection were reserved for the only kind of ulcer which I think might reasonably call for this operation—viz., the posterior type ulcerating into the pancreas—the mortality-rate would be higher than 2·3 per cent., and I got the impression from Mr. Pannett's paper that he does gastro-jejunostomy for ulcers in this place and of this kind.

Just one more criticism. Mr. Pannett says for the stubborn recalcitrant cases of duodenal ulcer there are three accepted surgical operations—gastro-jejunostomy, pyloro-duodenal resection, and pyloro-plasty. Why does he not mention gastro-duodenostomy, which, I think, has a position in surgical procedure more assured than the two he mentions last?

I am, Sir, yours faithfully,
E. R.

Leeds, June 9th, 1931.

THE ST. CYRES LECTURE.

To the Editor of THE LANCET.

SIR,—May I ask you to print in your journal this simple protest against the publication in your issue of May 23rd of a full abstract of my St. Cyres lecture without my knowledge, and without my being afforded any opportunity of correcting the many inaccuracies that your printed account contains. Although it is derived from my lecture I am not prepared to accept responsibility for any part of this publication in your journal.

I am, Sir, yours faithfully,

THOMAS LEWIS.

Department of Clinical Research, University College Hospital, Medical School, University-street, W.C. 1, June 3rd, 1931.

*** By omission of the names of his collaborators our report has made Sir Thomas Lewis appear responsible for certain experiments and conclusions not his alone. We regret that it contains inaccuracies—for example, Potain's name is given as Potter, and Allbutt's theory of anginal pain is attributed to Parry.—ED. L.

ADEQUATE TREATMENT OF SYPHILIS.

To the Editor of THE LANCET.

SIR,—My article has evoked three letters to which I must reply.

In my opinion all that Colonel Harrison has said and quoted with regard to the occurrence of neurosyphilis is not so much to be interpreted as due to the use of a single remedial agent but more essentially to the inadequate amount of it used during a given period—in other words, to the low efficiency index of the course. Similarly with Moore and Kemp's neuro-recurrences, the striking feature of the cases was the utter inadequacy of the treatment—again a low efficiency index. Among their 71 patients who completed the scheduled course—which has an efficiency index of 90—there was no case of neuro-recurrence. So far as the defaulter is concerned, an early and clinical neuro-recurrence—and 90 per cent. of Moore and Kemp's cases occurred within the first six months—is by no means the worst thing that can happen. It is probably the best, for it quickly brings the patient back for further treatment. The defaulter from concurrent therapy may not exhibit a neuro-recurrence, but his uncured syphilis is most certainly causing grave visceral damage, 'though years may elapse before it is clinically recognisable. When his true condition is eventually discovered, not only is the structural and functional damage permanent, but in the interval he almost certainly has conveyed the disease unwittingly to others.

Concerning the elimination of arsenobenzene compound, surely there is experimental evidence (Clausen and Jeans, Kolmer, and others) which goes to show that approximately half of each dose is retained in the tissues and is gradually eliminated over a period of many weeks. Indeed Mr. Lees mentions this in the latter part of his second paragraph. Of course, the fullest therapeutic effect is seen in the first three days after the injection, and this is the reason why, when the patient can attend twice in the first week, we give him during that time two intravenous Conctions of 0·3 g. stabilarsan. I agree that for every hygien neuro-recurrence there must be a number Army S. Col. Nott with cerebro-spinal fluid abnormalities. was also tlies equally to cases treated alternatingly, concurrently, or monotherapeutically. In Report No. 132, p. 48, Colonel Harrison himself says that "a form of treatment which is followed by fewer clinical neuro-recurrences than is another, can be expected also to have considerably fewer cases with pathological changes in the cerebro-spinal fluid." Since, then, there is no difference between our two lines of treatment with regard to clinical neuro-recurrence, may we not assume that the same will obtain in respect of cerebro-spinal fluid? In so far as Bernard's investigation is concerned I would again point out that the value of a line of treatment can only be assessed from patients who have completed the course and not from those who have defaulted.

Mr. Lees seems to suggest that my methods and arguments are supported merely by the 136 cases to which I referred in the *British Journal of Venereal Diseases* (1930, vi., 212). If so, he does me an injustice. These were simply a series of male cases who had completed the scheduled course for early syphilis, had fulfilled the criteria of cure, and who, during an observation period of from three months to nine years, had suffered no relapses, clinical or serological. My thesis is based not upon these only, but upon all the syphilitic patients seen at the Warrington and Salford municipal clinics from 1921 to 1931. However, even upon the number given, I am entitled to give a reasoned opinion. If Mr. Lees really thinks that "most clinicians will be unable to accept an opinion based upon so small a number of cases observed for an inadequate period," then he and most clinicians will likewise be unable to accept the opinions of Colonel Harrison in Report No. 132. There, in respect of sero-negative primary syphilis, there are only 183 cases tabulated (Table G., p. 32), and of these, only 53 completed the course. Of the total, only 25 were under observation for over three years, and 99, or 54 per cent., were only observed for 12 months and under. In 147 sero-positive primary patients, only nine were observed for over three years, and with respect to the 181 early secondary cases, the observation period was over three years in only 11 instances. In this connexion, then, Dr. Allen's remark that I have not observed my cases long enough or adequately enough, applies, of course, with equal force to Colonel Harrison's series. What Dr. Allen's experience may be I do not know, but mine—and apparently also Colonel Harrison's—is that there is only a small percentage of cases that one can keep under observation for more than three years. One must adopt reasonable and practicable standards of cure and observation. Mine are: absence of clinical and serological signs after provocation for at least two, and if possible three, years after the cessation of treatment.

Mr. Lees states that the rest intervals under concurrency are not provided to allow the patient to recover from the toxic effects of the agents, and yet, in the next sentence, he admits just that very thing. He says that the drugs are stored up in the tissues and that the rest intervals are to allow the body to use them up or to eliminate them. If the rest were not given, then surely the accumulation would produce toxic symptoms. That is the clear reason why the rest period is adopted. Mr. Lees finds the incidence of complications very uncommon simply because he introduces so many rest intervals in his course to avoid them. Let him cut out these periods and see what happens. The duration of his course for sero-negative primary syphilis is 103 weeks, during which time there are only 64 weeks of actual therapy, counting the provocative injections as such. Rest intervals occupy 38 per cent. of the time, and treatment 62 per cent. During the 64 weeks of therapy, in only 15 are the drugs given concurrently.

Mr. Lees says that "there is no accepted proof that bismuth when injected into the body produces a toxalbumin." I would refer him to "Le bismuth dans le traitement de la syphilis" by Levaditi (Paris, 1924), p. 262 et seq., and to the references contained therein. My view about mercury is that where there is no contra-indication to Ab.C. or bismuth, to use that agent is a waste of time. I am in full agreement with Colonel Harrison in that we know from past experience of patients "treated conscientiously with mercury for two years, and from observation of later effects, the most that this is likely to do is to keep the serum reactions negative and everybody concerned in a fool's paradise."

Neither Mr. Lees nor Dr. Allen appears to like my method of evaluating therapy. I cannot reply to their criticisms in detail, but perhaps they may find the idea more clearly expressed in the *American Journal of Syphilis* (April, 1931, p. 155). I do not know what to make exactly of Dr. Allen's observations. The first would suggest that he is not very well acquainted with the methods of testing the chemotherapeutic index of a drug. He must surely see how fallacious would be his method. In his third observation he has misinterpreted my meaning. What I do wish to convey is that during the seven-day time-period, whatever the amount of drug given, it should be the optimum for that particular patient at that particular time. One does not give less than is necessary or more than is safe. It is just in this respect that my method does take great account of varying factors such as the condition and age of the patient. The proof of the pudding is the eating thereof. Assessing various schemes of treatment according to the method I suggest, one finds that, for example, in sero-negative primary syphilis, the efficiency index must not fall below 70 in order to get a satisfactory percentage of cures. I have studied the efficiency indexes of some of my relapsed cases, and in none of them has the index been above 70.

I am not seeking to standardise treatment in the way that Mr. Lees suggests. I have merely put forward a method whereby we may have a measuring-rod which will enable us to say that therapy, to be adequate, must not fall below a certain index figure. From practical experience we have found that method useful here, and that is—as Mr. Lees and Dr. Allen will agree—of far more value than their purely theoretical objections. The point is that this method *works*, whereas treatment calculated in terms of quantity of drug given in a certain time is utterly meaningless.

I am, Sir, yours faithfully,
E. TYTLER BURKE.

Municipal Clinic, Salford, June 8th, 1931.

To the Editor of THE LANCET.

SIR,—On June 21st, 1930, you published a very able, and very disturbing, paper by Dr. J. H. Sequeira on the Activation of Syphilis by Treatment, which should be read in connexion with the present discussion. An earlier communication relating to the work of Cesar Boeck and the pathological investigations of Bruusgaard and of Warthin appears in the issue of Jan. 18th, 1930 (p. 159). Together they constitute a severe arraignment of modern methods as failing to prevent serious visceral and neural involvement and proving otherwise doubtfully effective.

And yet it is clear that syphilis seems sometimes to be cured very quickly, and by the simplest means. In hospitals and institutions catering for elderly men one occasionally meets evidence of an early infection, and elicits such a history as the following, quoted as typical. Questioned about the unmistakable scar left by a chancre, the patient, now 70, states that at the age of 19 when on a voyage to the Cape a sore appeared on the penis, and as it was not healing the mate had him swallow regularly some "pills." After about a month the place got well, the pills were stopped, and no further treatment taken. Three or four years later he married; and except for the recent difficulty with his water his health has been excellent, and the married life of himself and his buxom and contented wife quite uneventful. Upon request they bring along several children and grandchildren for inspection; no evidence is found of inherited disease, no history is elicited of miscarriages, and the blood of one of the adults, chosen as representative, is Wassermann-negative. It is therefore reasonable to conclude that the mercury that this man undoubtedly was given proved neither "inefficient" nor a "mere waste of time."

Few will contend that the administration of arsenobenzene preparations constitutes alone an adequate treatment of syphilis. Probably a majority of experienced specialists continue to regard mercury as the necessary complement of arsenic in antiluetic treatment, assigning to bismuth a position somewhere between the other two, as a sort of hybrid possessing something of the properties of each but the therapeutic efficiency of neither.

The arsenobenzene preparations are pre-eminently direct spirochæticides. Sir Jonathan Hutchinson believed that the action of mercury in early syphilis was very similar but that at a later stage it was principally indirect, or in other words, that it was antigenic; and it was his experience that where small doses of grey powder were taken regularly over a sufficient period recurrences were extremely rare. Writing in 1909, he states definitely that no case of paraplegia had ever occurred among his own patients—and he had then been in active practice for 50 years.

Many thoughtful observers believe that the outlook for complete and lasting recovery would be bettered if the treatment of recent syphilis were commenced with a reasonably long course of mercury, given in small doses and chiefly for its assumed antigenic properties, the arsenicals being held in reserve until some immunity or insulation is considered to have been established, when they would be brought forward to reinforce the fully stimulated natural resistance. Although not proved, it is reasonable to suppose that something more than a cell response is evoked by the presence of *Sp. pallida* in the human body. It may well be that the presence of spirochætes in numbers and over a period is also necessary for the acquirement of adequate protection.

I am, Sir, yours faithfully,
H. D. L. SPENCE.

Great Russell-street, W.C. June 9th, 1931.

THE DIFFICULT CHILD.

To the Editor of THE LANCET.

SIR,—In your annotation of May 16th (p. 1097) criticism was made of the extent to which the social worker is allowed to conduct the active operations of child guidance work, and of the inadequate provision for dealing with the more difficult parent of the difficult child. This evoked some comment from my colleague, Dr. Emanuel Miller, and I should like to amplify his remarks. As far as our knowledge goes, we incline to agree that the former criticism may be a just one when applied to the methods of child guidance as practised in American clinics. In our own clinic, which is modified from the American pattern, it is our aim that both diagnosis and treatment shall be kept, at every step, under the close personal care of the physician, believing that this is essential to sound work.

As to the parents who, in our experience as in yours, provide the most frequent and the most difficult problems, our practice is to devote much personal effort to the correction of their psychological difficulties rather than "tacitly to leave them to be handled by the social worker." Detailed investigation of parental habits and of home conditions is, and must be, carried out by the social worker who is specially trained for the work. How many physicians have anything like her experience or skill in this respect? At the same time it becomes increasingly obvious that personal contact between psychiatrist and parent is to be desired in every case. In our last 100 cases, including several children whose attendance has only just begun, one of the parents has been seen by the psychiatrist in 92 instances, both in 32, while other members of the family have been interviewed in 19. Some parents have been sent for periods of so-called convalescence and some have been referred to appropriate clinics for more overt and active psychotherapy.

It is true, as you say, that "the problem of the parent has not been wholly solved by the child guidance scheme," but it has at least been brought more fully into the light, which should be a first step towards solution.

I am, Sir, yours faithfully,

London, S.W., June 5th, 1931. NOEL H. M. BURKE.

SUPERVISION AND DEATH IN CHILDBIRTH.

To the Editor of THE LANCET.

SIR,—While some papers correctly, though briefly, reported an address which I gave before the College of Nursing Post-graduate Course at the London School of Hygiene on May 18th, others did not, and serious mis-statements were included in certain reports. My official position normally precludes me from attempting to correct any perversion of my addresses or papers by communicating with the press. In the present instance, however, I fear that serious misunderstanding may arise from the incorrect attribution to me of a statement that, if I had the supervision of maternity cases, I could guarantee a reduction of three-quarters of the present average mortality. What I did say was that if effective medical and midwife supervision of maternity cases began early enough and was properly maintained up to and after childbirth, ultimately the maternal mortality-rate might well be reduced by as much as three-quarters. This is indicated by the excellent results already secured in existing practice which are recorded on p. 106 of the Interim Report of the Departmental Committee on Maternal Mortality for 1930.

I am, Sir, yours faithfully,

GEORGE NEWMAN.

Ministry of Health, Whitehall, S.W.,
June 9th, 1931.

CHAIRS OF PHYSIOLOGY.

To the Editor of THE LANCET.

SIR,—Surely Prof. J. F. Fulton is wrong when he says (p. 1211) that the Waynflete chair of Physiology at Oxford was created in 1878. Burdon Sanderson was created Waynflete professor of physiology in 1882. Until 1881 the chair was held by my father, George Rolleston, who was Linacre professor of anatomy and physiology. After his death in 1881 the chair was divided into two, Moseley taking comparative anatomy and morphology and Burdon Sanderson physiology. It was not, I think, until some years later that Arthur Thomson was made professor of human anatomy.

I am, Sir, yours faithfully,

June 9th, 1931. CHRISTOPHER ROLLESTON.

*** Our issue of June 17th, 1882, contained the announcement that "advertisements will speedily be issued for the Waynflete professorship of physiology."—ED. L.

MEDICAL NEWS

University of Cambridge.

On June 6th the following degrees were conferred:—

M.D.—R. M. B. MacKenna, C. C. R. Downing, J. P. Marsden, and M. E. Lampard.

M.B.—H. L. Hoffman.

B.Chir.—C. O. Barnes.

Society of Apothecaries of London.

At recent examinations the following candidates were successful: *Master of Midwifery*—A. V. Clemmey, B.M., Archibald Gardiner, M.B., Greta Hartley, M.B., and Eva J. Newton, M.B.

University of London.

At recent examinations the following candidates were successful:—

THIRD EXAMINATION FOR M.B., B.S.

Honours.—H. W. Howell (*a*), and L. H. Howells (*a*), London Hosp.; A. F. Z. Judd (*a*), L.S.M.W.; Muriel H. E. Long (*c*) King's Coll. Hosp.; P. V. Reading (*d*, *e*, University Medal), and T. F. Todd (*e*), Guy's Hosp.; and Marion E. Townsend (*e*) L.S.M.W.

(*a*) Distinguished in Medicine. (*c*) Distinguished in Forensic Medicine. (*d*) Distinguished in Surgery. (*e*) Distinguished in Midwifery.

Pass.—R. M. Alderton, London Hosp.; Gwendolen E. Austin, King's Coll. Hosp.; Frederick Back, St. Thomas's Hosp. and London Hosp.; E. E. Barnett, London Hosp.; A. L. Basham, St. Thomas's Hosp.; J. E. L. Bendor-Samuel, and C. C. Beresford, London Hosp.; Ilma B. S. Bingemann, St. Mary's Hosp.; Helen B. Burt, and Joan Butterworth, L.S.M.W.; A. C. Byles, St. Mary's Hosp.; P. H. Charlton, Middlesex Hosp.; D. O. Clark, St. Thomas's Hosp.; A. R. Clarke, Guy's Hosp.; R. D. Darley, Univ. Coll. Hosp.; H. L. G. Davies, St. Bart.'s Hosp.; S. D. Elliott, Univ. Coll. Hosp.; W. J. Ferguson, Guy's Hosp.; L. P. Friedman, Univ. Coll. Hosp.; R. J. Furlong, St. Thomas's Hosp.; A. P. Gaston, St. Bart.'s Hosp.; J. B. George, St. Thomas's Hosp.; S. J. Golden, London Hosp.; Rebecca Goldstein, Univ. Coll. Hosp.; R. T. S. Goodchild, London Hosp.; P. R. Graves, St. Thomas's Hosp.; S. R. Gunewardene, Univ. Coll. Hosp. and Ceylon Med. Coll.; F. R. Gusterson, St. Thomas's Hosp.; R. L. H. Harris, St. Bart.'s Hosp.; Ruth M. Harris, L.S.M.W.; W. H. Harris, Victoria Univ. of Manchester; William Hogg, St. Bart.'s Hosp.; S. W. Holmes, St. Mary's Hosp.; H. R. Hovsha, King's Coll. Hosp.; D. T. Ishmael, St. Bart.'s Hosp.; Evan Jones, St. Thomas's Hosp.; H. W. Jordan, J. D. Kershaw, and A. T. L. Kingdon, Univ. Coll. Hosp.; Nathan Kramer, St. Bart.'s Hosp.; F. P. L. Lander, Middlesex Hosp.; E. S. Lee, Westminster Hosp.; P. A. T. Lowden, St. Thomas's Hosp.; Mohabeer Luckeenarain, Westminster Hosp.; Univ. Coll. Hosp.; Robert Machray, Westminster Hosp.; Wylie McKissock, St. George's Hosp.; Henrietta M. Macleod, L.S.M.W.; K. M. Masani, and J. H. G. Mason, Middlesex Hosp.; Bertha I. Meyer, L.S.M.W.; T. W. Mimpriss, St. Thomas's Hosp.; Joseph Mindline, Westminster Hosp.; Ian More, Univ. Coll. Hosp.; Kathleen J. Mulvany, Charing Cross Hosp.; Lois M. Munro, L.S.M.W.; W. L. Neustätter, Univ. Coll. Hosp.; G. H. Nowns, King's Coll. Hosp.; J. E. A. O'Connell, and A. P. M. Page, St. Bart.'s Hosp.; D. N. Parfitt, Univ. Coll. Cardiff; F. L. L. Patrick, St. Bart.'s Hosp.; A. L. Pereira, St. George's Hosp.; J. H. Pierre, St. Bart.'s Hosp.; N. S. Plummer, Guy's Hosp.; D. C. Price, St. Bart.'s Hosp.; Helen M. M. Reid, L.S.M.W.; T. S. Rodgers, Westminster Hosp.; K. M. Ross, St. Bart.'s Hosp.; Samuel Scher, Univ. Coll. Hosp.; V. E. P. Senewiratne, Ceylon Med. Coll. and

Univ. Coll. Hosp.; G. C. Sheldon, King's Coll. Hosp.; Helana Sidarous, L.S.M.W.; S. K. Squires, *St. Mary's Hosp.*; *Eileen* M. G. Stevenson, L.S.M.W.; R. G. Thomas, St. Thomas's Hosp.; J. A. White, St. Mary's Hosp.; I. G. *Williams, Middlesex* Hosp.; F. W. Willway, King's Coll. Hosp.; and William Young, St. Mary's Hosp.

The following students have passed in one of the two groups of subjects:—

Group I.—Wolf Aukin, Univ. Coll. Hosp.; H B. Barker, St. Mary's Hosp.; H. W. Benham, Univ. Coll. Hosp.; A I. P. Brown, London Hosp.; Albert Burkhardt, Univ. Coll. Hosp.; E. H. Capel, Middlesex Hosp.; A. F. H. Coke, St. Mary's Hosp.; H. E. B. Curjel, St. Thomas's Hosp.; J. O. F. Davies, Middlesex Hosp.; S. B. Dimson, and P. G. Dowdell, *Univ. Coll. Hosp.*; E. H. Evans, Univ. Coll. Cardiff and Univ. Coll. Hosp.; Phyllis M. Fraser, L.S.M.W.; J. B. Great Rex, St. Bart.'s Hosp.; Hilary S. M. Hadaway, L.S.M.W.; D. W. James, Guy's Hosp.; E. G. M. Jones, Univ. Coll. Hosp.; B. W. Knight, St. Bart.'s Hosp.; G. A. M. *Lintott*, Guy's Hosp.; W. F. McGladdery, St. Bart.'s Hosp.; Dorothy Makepeace, King's Coll. Hosp.; S. F. Marshall, St. Bart.'s Hosp.; *Gwendolen E. M. Meyer, Charing Cross Hosp.*; J. F. Morton, Guy's Hosp.; D. D. Payne, St. Thomas's Hosp.; R. N. C. Smith, and Ben Southwell, Guy's Hosp.; Thomas Standring, King's Coll. Hosp.; F. L. Wheaton, Middlesex Hosp.; S. J. Wheeler, Guy's Hosp.; and E. L. Williams, Univ. Coll. *Hosp.*

Group II.—I. S. Acres, *London Hosp.*; K. C. Buck, St. Mary's Hosp.; Margaret E. Cope, L.S.M.W.; D. F. L. Croft, and J. R. Crumbie, *St. Bart.'s Hosp.*; E. B. *Grogono*, J. M. Harker, and B. T. W. Harvey, London Hosp.; K. L. James, Univ. Coll. Hosp.; Samuel Lefcovitch, Guy's Hosp.; K. S. May, King's Coll. Hosp.; E. R. R. Mellon, Guy's Hosp.; H. S. Morton, London Hosp.; D. K. Mulvany, King's Coll. *Hosp.*; *C. F. Price*, and W. M. Priest, Univ. Coll. Hosp.; J. M. Robertson, Guy's Hosp.; R. W. Scarff, Middlesex Hosp.; M. R. Thomas, and W. J. *Tindall, Univ. Coll. Hosp.*; R. S. Wale, King's Coll. Hosp.; and Gordon Wells, St. Bart.'s Hosp.

L.S.M.W. = London School of Medicine for Women.

International Congress for Light.

The secretary-general of this congress (see THE LANCET, April 4th, *p. 783) asks us to state again* that the meeting is to be held in Copenhagen in 1932 and not this year. A *detailed programme will be* available in the autumn.

Federation of Cremation Authorities.

This association will hold its tenth annual conference in Ipswich from June 19th to 23rd. Among the speakers on the 22nd will be Sir William Willcox, Dr. A. N. M. Pringle, Sir W. Arbuthnot Lane, and Dr. W. E. Dixon, F.R.S.

Reception by R.A.M.C.

The officers of the Royal Army Medical Corps held a reception at their headquarters mess at Millbank, London, on June 4th. A large company of guests was received by Lieut.-General Sir Harold Fawcus (Director-General, Army Medical Services) and Lady Fawcus.

Memorial to Dr. J. Llewellyn-Jones.

On Sunday, June 7th, Princess Victoria visited Gerrard's Cross, Buckinghamshire, to unveil in the parish church a tablet erected to the memory of Dr. John Llewellyn-Jones, who died in February of last year. An address was given by Mr. D. Cotes-Preedy, K.C., Recorder of Smethwick, himself a member of the medical profession and an old friend of Dr. Llewellyn-Jones. A large congregation attended.

Fellowship of Medicine and Post-Graduate Medical Association.

Arrangements for the coming week will be found in our Medical Diary. On June 15th a fortnight's course on diseases of children begins at the children's clinic and various hospitals, and a three weeks' course on tropical medicine at the Hospital for Tropical Diseases. Also starting next week, a course of six demonstrations on fractures, on Tuesdays, Wednesdays, and Fridays for two weeks, will be given at the Royal Albert Dock Hospital at 4.30 P.M. by Mr. Hope Carlton and Mr. Ernest Griffiths. Copies of all syllabuses and tickets may be had from the secretary of the Fellowship at 1, Wimpole-street, London, W. 1.

International Socialist Medical Conference.

At the end of May nearly 200 doctors, representing about ten national socialist medical associations, met in conference at Carlsbad in Czecho-slovakia. Dr. Somerville Hastings, M.P., and Dr. W. Rutherford represented the newly formed British Socialist Medical Association. The chief business of the meeting was the formation of an international association; the central bureau is for the present to be in Berlin with Dr. Ewald Fabian as secretary. At the discussion it was pointed out that in many countries the health of the children, especially those of the unemployed, is being lowered, and that in the younger unemployed men nervous disorder and crime are increasing. A resolution was carried in favour of increased allowances for the unemployed, raising of the school-leaving age to 16, shorter hours of labour, and the building of more houses for the people.

Medical Congress in Carlsbad.

The thirteenth Carlsbad International Medical Educa*tional* Congress (with special reference to balneology) will be held at Carlsbad from Sept. 13th to 19th. Among the participants will be Dr. Philip Manson-Bahr (London) who will give an address on the Dawn of Tropical Medicine. Members of the congress will be *guests of the town during* their visit. Particulars may be had from Dr. Edgar Ganz, Carlsbad, Czecho-slovakia.

Scottish Midwives Conference.

Under the presidency of Dr. Margaret Scott-Dickson, the fourteenth annual meeting of the Scottish Midwives' Association was held at Dundee Royal Infirmary last Saturday. It was felt that the members had a very real grievance in that they were frequently required to give their services without receiving any recompense. Strong criticism was levelled against the handywoman, and members were advised to report cases in which the woman of the house had taken on the duties of the midwife.

Tonsil Surgery in Paris.

Under the auspices of the Association for Post-graduate Teaching of the Hospitals of Paris, a series of discussions and surgical demonstrations on Tonsil Surgery are being given from June 15th to 17th at the Hôpital Necker-Enfants Malades by Dr. J. M. Le Mée, Dr. André Bloch, and Dr. M. Bouchet, with the assistance of Dr. Weill-Hallé and Prof. G. Canuyt. The lectures will be delivered in the afternoon between 4 and 6. The demonstrations will be held in the mornings from 10 to 12. Explanations will be given as required in French, English, German, or Italian. Arrangements are in the hands of Dr. Magdelaine, assistant at the hospital, 149 rue de Sèvres, Paris.

Post-graduate Lectures on Proctology.

The staff of St. Mark's Hospital, City-road, London, E.C., is giving a series of weekly lectures on proctology to medical practitioners. Each lecture will begin at 4.30 P.M., and the following days and subjects have been arranged: Monday, July 6th, Mr. J. P. Lockhart-Mummery: Perineal Excision of the Rectum (with cinematograph demonstration). Thursday, the 16th, Sir Charles Gordon-Watson: Carcinoma of the Colon. Wednesday, the 22nd, Mr. L. E. C. Norbury: Prolapse of the Rectum. Tuesday, the 28th, Mr. W. B. Gabriel: Anal Fissure.

Medical Golfing Society.

The annual summer meeting was held on May 28th at Walton Heath where the 96 competitors were the guests of Lord Riddell. The results were: THE LANCET Cup (scratch), Dr. W. H. Lamplough, all square; Henry Morris Cup (Handicap), Dr. W. H. Lamplough, 2 up. Class 1. First Prize, Dr. J. Wallace; Second Prize, Dr. Gilliatt; best last 9, Mr. George Dawson. Class 2. First Prize, Dr. C. H. Ilott: Second Prize: Dr. C. Branwell; best last 9, Dr. Rolf Creasy. Foursomes: Mr. Rowley Bristow and Dr. W. H. Lamplough after a tie at 3 up with Dr. Galletly and Dr. McGrath. The Knock-out Tournaments and Milsom Rees Cup was won by Sir Kenneth Goadby, the runner up being Dr. Bathurst.

Debt of London Hospital.

At the quarterly meeting of governors last week Lord Knutsford, the chairman, stated that the loan from the bank now stood at £44,000, and that if borrowing continued at the present rate the limit as covered by the general purposes securities would soon be reached. All building extensions are to be postponed until the money is actually in hand.

Testimonial to a Medical Man.

The sum of £501 is to be handed over to the family of Dr. William Muir who died in March at Davidson's Mains, Edinburgh. The sum was the result of a collection raised as a testimonial to Dr. Muir when it seemed probable that he would recover from his illness. For 35 years Dr. Muir carried on practice in the district, with self-sacrificing devotion, and he also interested himself greatly in public affairs, especially in education.

Founders' Day at Alton.

The celebration of Founders' Day at the Lord Mayor Treloar Cripples' Hospital and College at Alton, Hants, last week was marked by the opening by Sir Roger Keyes of the Portsmouth block which contains the Fourth Destroyer Flotilla and Naval Memorial Wards. In the wards are tablets commemorating the names of officers and men who fell in the battle of Jutland. There are 300 children under treatment and 50 boys are being trained in the College. Lord Burnham, the senior trustee, who presided, stated that the old wooden buildings left over from the Boer War are fast disappearing and being replaced by a hospital "that would be a model for the world."

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

MEDICAL SERVICES AND THE PETROL DUTY.

On June 8th the House of Commons began consideration of the Finance Bill in Committee. The discussions were limited by the time-table adopted last week, with the result that large numbers of amendments on the Order Paper were not called upon. Clause 1 of the Bill increases the customs duty on hydrocarbon oils from *4d.* to *6d.* a gallon. Lieut.-Colonel Fremantle and other Members had given notice of amendments exempting from the operation of the duty petrol used by medical practitioners and veterinary surgeons in carrying on their medical and veterinary practices and petrol used in hospital ambulance work.

During the debate on the question that Clause 1 should stand part of the Bill,

Lieut.-Colonel Fremantle said that under the Guillotine Resolution the Committee was compelled to pass over a number of amendments to this clause which were of definite importance, and as an illustration he might mention two in which he was particularly interested. They were the amendments which suggested exemption first in the case of ambulances attached to hospitals, and, secondly, in the case of medical and veterinary practitioners. There were precedents for these proposals, and he only spoke of them as illustrating the damage which could be done by imposing a general duty of this sort without giving any time for the consideration of the exemptions. In the Finance Act of 1910, which originally imposed the motor spirit duty, medical men were given a rebate of one-half of the duty in respect of motor-cars owned and worked by them in carrying out the duties of their practice. As regarded ambulances, there was also a definite precedent. At present lifeboats were exempt. Why then should the ambulances of hospitals be taxed? They were required more than ever to-day because of the increasing number of road accidents. The cost of attending to those accidents was not borne by the Government and was not to any large extent borne even by the people who suffered, but was to a large extent borne by the voluntary hospitals, the ambulance services, and the St. John's Ambulance Association.. A very small proportion was paid by the people who had the benefit of those services. He knew that in theory the Government proposed to their Socialist supporters that there should be Socialistic services of this kind, and that all these things should be run by the State; but, on the other hand, they often came to the House of Commons and said: "We have to take things as they are." Then they put even greater burdens upon the people who already had to bear the incubus of these services. They said they were compelled to do so pending the nationalisation of those services. They might one day have the nationalised medical service proposed by Dr. Hastings, but he (Colonel Fremantle) thought that it would be a long time before they had it. It would be the acid test of the theory, because people would then have the opportunity of realising the rights and wrongs, the advantages and the disadvantages, of a mechanical system. This clause would add considerably to the cost of running ambulances and to the expenses of the country doctor. He reckoned that to the ordinary country doctor who covered 20,000 miles in the year, and whose car did 20 miles to the gallon, the extra *2d.* would mean an extra £10 a year. This was a definite case which the Government ought to face. So long as they were dependent to a large extent on voluntary institutions for such essential public services any Government ought to relieve them as far as possible of fresh taxation in so far as it applied to their work in the service of the community.

The clause was agreed to.

Sentence of Death (Expectant Mothers) Bill.

On June 2nd in the House of Commons the Sentence of Death (Expectant Mothers) Bill was read the third time. On June 5th in the House of Lords the same Bill was introduced and read a first time.

HOUSE OF COMMONS.

THURSDAY, JUNE 4TH.

Ice Cream Vendors.

Sir Cooper Rawson asked the Minister of Health if he had, in the interests of public health, considered the desirability of the compulsory registration of itinerant ice-cream vendors with the local authority to ensure control of the conditions of manufacture and the type of premises used in connexion with this commodity.—Mr. Greenwood replied: I could not undertake to introduce legislation on this subject at the present time. I may, however, draw the hon. Member's attention to Section 72 of the Public Health Act, 1925, which requires the maintenance of proper sanitary conditions in places where food is prepared for sale.

Sir G. Penny: Will the right hon. gentleman take samples in order to ascertain whether they are pure?

Mr. Greenwood: I am very willing to discuss with the Ice Cream Merchants' Association, who have been taking up this matter, any possible action that may be taken.

Hospital Sweepstakes.

Mr. Day asked the Home Secretary whether, in view of the public interest taken in the Irish hospitals sweepstakes held on the Derby and other English races, he would now consider the question of setting up a committee to inquire into the conditions that would be necessary and appropriate for the purpose of altering the existing lottery laws.—Mr. Clynes replied: The matter is now under consideration.

Mr. Charles Williams: May we expect a decision on the matter?

Mr. Clynes: You may, but I can say no more at present.

Private Nursing Homes in London.

Mr. West Russell asked the Minister of Health whether he could arrange for an annual report to be issued to show what was being done to improve the standard of private nursing homes in the metropolitan area and to close those which were in unsuitable neighbourhoods and structurally unfitted.—Mr. Greenwood replied: Under the Nursing Homes Registration Act, 1027, the London County Council is the local supervising authority in the metropolitan area outside the City of London, and a report on the administration of the Act is included in the annual report of the council. I understand that a complete statement of the present position will be included in the report for 1930 which is now in preparation.

Mr. A. M. Samuel: Is the right hon. gentleman doing anything to improve the acknowledged bad standard of some of these private nursing homes in the metropolis? Does he do anything to check it?

Mr. Greenwood: That is a matter for my predecessor.

Russian Butter.

Sir N. Grattan-Doyle asked the Minister of Health whether he had any statement to make concerning the report of Mr. Warburton, the official zoologist representing the School of Agriculture at Cambridge, in reference to a foreign body designated as a "parasite" discovered by him in a sample of Russian butter purchased in Cambridgeshire, and whether there was any danger of infection from such foreign body contained in an article of food?

Mr. Greenwood: I have no information on the subject except what has appeared in the press. I am making inquiries and will communicate with the hon. Member.

Sir N. Gratton-Doyle: Does the right hon. gentleman realise the seriousness of what has occurred? Does he realise the possibility of infection being conveyed into this country by Asiatic parasites which are entirely new and are a revelation even to the authorities?

Mr. Greenwood: I have no knowledge myself that one dead parasite could cause much harm to anyone.

Mr. Guinness: Will the right hon. gentleman consult with the Minister of Agriculture as to whether this may not be a case for bringing into force the power of prohibiting an import, just as is done in the case of maggotty cherries, which are far less objectionable or dangerous?

Mr. Greenwood: That is one of the matters into which inquiry is being made.

Lieut.-Commander Kenworthy: *Do these parasites* breed in mare's nests?

Boy's Sight and Vaccination.

Mr. Freeman asked the Minister of Health whether his attention had been drawn to the case of Victor Rands, aged 7 years, of Parsloes Farm, Dagenham, who lost the sight of his right eye as a result of vaccination in October, 1930, by the public vaccinator; whether he was aware that Victor Rands was at the time under treatment for a septic knee; that the child's eye got steadily worse, and the medical officer of health, when he saw the boy at the *minor ailments clinic, recommended him to be taken to the Moorfields Eye Hospital; and whether he would have* a thorough investigation made into this case.—Mr. Greenwood replied: My attention has been drawn to this case, and I have already made inquiry into it. I am informed that the vaccination was performed by a public vaccinator on Oct. 22nd, 1930, with the consent of the parents. The public vaccinator states that he found no physical reason on that date why the boy should not be vaccinated, nor did he observe any evidence of an affection of the eye when he inspected the vaccination on Nov. 4th. It was not until 36 days after the date of vaccination that the boy was taken to the school clinic at Barking on account of his eye trouble. I am advised that the course of events *is not consistent with the suggestions which have* been made that the affection of the eye was the result of vaccination or that vaccine entered the eye at the time of vaccination.

Committee on Food Standards.

Mr. R. J. Russell asked the Minister of Health the terms of reference for the Committee on Food Standards and the personnel appointed.—Mr. Greenwood replied: The terms of reference of the Committee are "to inquire into the working of the law as to the composition and description of articles of food other than milk, and to report what alterations, if any, in the law or its administra*tion appear to be desirable." The Committee is consti*tuted as follows:—Sir Frederick Willis (chairman), Mrs. J. L. Adamson, Mr. W. Barratt, Mrs. E. Beck, Mr. J. N. Beckett, Mr. G. A. Birse, Mr. H. F. Carlill, Mrs. N. E. Cottrell, Mr. A. T. A. Dobson, Mr. H. N. Goodby, Dr. J. M. Hamill, Mrs. Jean Roberts, Mr. R. A. Robinson, Mr. H. Shaw, and Mr. G. Stubbs.

Draft Conventions on Sickness Insurance.

Mr. Mander asked the Minister of Labour whether the Government had now ratified the draft conventions concerning sickness insurance for workers in industry and commerce and domestic servants, and sickness insurance for agricultural workers.—*Miss Bondfield replied: These* conventions were ratified by an Order in Council of Jan. 5th last.

MONDAY, JUNE 8TH.

Tuberculosis among Naval Ratings.

Sir Bertram Falle asked the First Lord of the Admiralty the number of ratings invalided with tuberculosis who were sent sick from H.M.S. *Warspite* during the last commission.—Mr. G. M. Hall (Civil Lord of the Admiralty) replied: The number of cases of tuberculosis which have occurred in H.M.S. *Warspite* since she recommissioned on Jan. 23rd, 1929, is 13, of which 11 have been invalided and two have *died in hospital.*

Sir B. Falle asked Mr. Hall specially to inquire into this matter and ascertain why there had been so many cases, and how many of these men had been pensioned.

Mr. Hall replied that 8 were *pensioned out of* 13. An inquiry had already been held, but unfortunately they were not able to ascertain the actual cause of the very high percentage of cases in 1929.

Child Marriages in India.

Miss Rathbone asked the Secretary for India (1) if he would report to the House what steps, if any, had been taken by the central and local governments of India to carry out the steps recommended two years ago *by the Joshi* Committee as necessary to render effective the administration of the Sarda Child Marriage Restraint Act—namely, a wide publicity campaign aided by State funds; the keeping of marriage registers in a prescribed form with details of age, &c.; universal compulsory notification of marriages and births; the issue *free* of charge of certificates of birth and marriage to the parties concerned; the employment of women police, women jurors and assessors, and medical women in the investigation of sexual offences; and the provision of separate women's waiting rooms at all court houses; and (2) how many complaints of violation of the Sarda Act of Restraint of Child Marriage had been received and dealt with by the courts since the Act came into force on April 1st, 1930, distinguishing between cases prior to *and those subsequent to the formal cessation of the campaign* of civil disobedience.—Mr. Wedgwood Benn replied: The Child Marriage Restraint Act, generally known as the Sarda Act, which was enacted on Oct. 1st, 1929, and came into operation on April 1st, 1930, makes it an offence punishable by fine or, in certain cases, by imprisonment or by both, to contract or arrange a marriage between persons either of whom is below the age of 18 in the case of the male and 14 in the case of the female. The Act further prescribes that to enable the appropriate court to take cognisance of an alleged offence under the Act, a complaint must be laid, within 12 months of the solemnisation of the marriage, in respect of which an offence is alleged. The actual inquiry into the complaint, if one is authorised by the court, is conducted by a magistrate. I am informed that between April 1st, 1930, when the Act came into force and February of this year there were 29 prosecutions under the Act. I have no more recent information, but the number of prosecutions since February is probably very small, if only for the reason that, as the House is no doubt aware, there are a number of private amending Bills which are either already before the Indian Legislature, or of which notice has been given. The Joshi Committee reported on June 20th, 1929, some months before the Sarda Bill was enacted in its final form, and its terms of reference were therefore framed without specific reference to that Act. Several of its recommendations, including those mentioned in Miss Rathbone's first question, have been referred by the Government of India to local governments. Until the views of all of these have been received and considered the Government of India are not able to decide what further steps can be taken in regard to these recommendations.

TUESDAY, JUNE 9TH.

Safety of Life at Sea.

Rear-Admiral Beamish asked the President of the Board of Trade what governments who were represented at the convention of 1929 for safety of life at sea had ratified that convention; *and if any reservations had been declared.*—Mr. W. Graham replied: Up to the present Denmark and the Netherlands only have ratified the convention, with no reservations in either case.

Insurance Chemists and Gifts to Customers.

Colonel Howard-Bury asked the Minister of Health whether the Government had now come to a decision upon the proposal to introduce legislation to repeal the section which prohibited insurance chemists from giving an insured person an inducement by gift or otherwise in consideration of his presenting an order for drugs or appliances on a national health insurance form.—Miss Susan Lawrence *(Parliamentary Secretary to the Ministry of Health)* replied: Legislation is not necessary to deal with this point, but an appeal has been made against the recent decision of the courts in the matter, and until it has been heard my right hon. friend cannot properly make any statement.

Anti-vaccinal Serum.

Mr. Freeman asked the Minister of Health whether his department was taking any action in regard to the adoption of the use of an anti-vaccinal serum as a treatment in cases of post-vaccinal encephalitis which was strongly urged by the Rolleston Committee on page 72 of their second Report.—Mr. Greenwood replied: An anti-vaccinal serum has been made available and *has been employed by the medical* attendant in those cases of suspected post-vaccinal encephalitis which have since been reported and of which sufficiently early information has been received.

Rates on Hospitals.—At the annual meeting of Darlington General Hospital it was stated that the rates upon the building have risen in two years from £15 to £850.

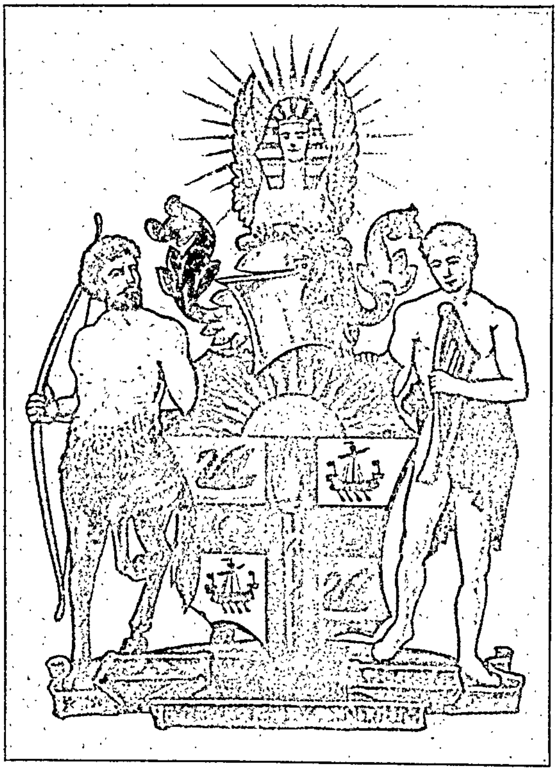
Slippery Hospital Floors.—Dr. Edwin Smith, the coroner for Battersea, recently held an inquest on a female patient of 88 in the Tooting Bec Mental Hospital who, according to the medical evidence, died of pneumonia following fracture of the thigh. It was stated that the patient fell, outside the ward, on a stone floor. The coroner asked "if something could be done to the *floors which* would keep them just as polished but less slippery," and it was arranged that the matter should be brought before the committee.

NOTES, COMMENTS, AND ABSTRACTS

ROYAL COLLEGE OF SURGEONS OF AUSTRALASIA.

OUR last issue contained mention (p. 1256) of the arms lately granted to this College. The accompanying illustration shows the achievement approved by the College of Heralds. The heraldic description is as follows:—

Or and argent between a St. George's cross upon which is imposed a flaming torch or between two serpents each encircled proper. In cantons one and four, a Swan sable; in cantons two and three a Lymphad sable. On a chief azure, a rising Sun in glory.



Supporters: Dexter, Chiron; Sinister, Apollo.

Crest: a female Sphynx affrontée, winged and surrounded by an aureole of sun's rays; on a torse of the colours, Blue and Gold.

The whole standing upon a mount vert, arising from the Southern Hemisphere, in front of which is a scroll bearing the motto: "Fax Mentis Incendium Gloriæ."

Chiron, as the mentor of Nestor, may be regarded as the father of wisdom. He holds a bow as a symbol that he could protect education by force. Apollo, god of healing, holds his best known symbol, the harp, to show he can instil knowledge by gentle means. The lymphad, symbol of discovery by sea, is used in preference to a Viking or long ship, because this latter suggests discovery by Norsemen.

HEROES OF HEALTH.

THE importance of health and the need for prevention of disease are the points chiefly emphasised in a little book [1] designed for children about to leave African schools. The better to secure their interest and fire their enthusiasm the author tells the story of how disease in different forms and in different countries was fought and conquered by the great pioneers of preventive medicine. She describes the achievements of Pasteur, Manson, Ross, and a host of others less well known in simple language which cannot fail to arouse interest. The desire to impress on the young African the value of the scientific discoveries of our Western civilisation is obvious throughout, and she is to be congratulated on the skill and tact with which she attains her objective. "Heroes of Health" is a book which might be read with profit by most lay persons—old or young—and there are many chapters which could be read aloud with advantage to boys and girls in our own schools.

SLEEP.

BOUND in a colour which would keep people awake, and written in a racy, attractive style which would certainly not induce sleep in a reader, an interesting and informative volume [1] on sleep has reached us. It is written in the manner of an educational talkie, but is none the less useful. It deals with the nature of sleep as a biological need, and shows how the organism is only healthy when this periodic rest of all functions occurs regularly and in quantity requisite to the age and occupation of the subject. It deals with the sort of things that make for sleeplessness in everyday life and which more scientific treatises might scorn as beneath contempt. But ordinary people who are harassed by insomnia are not interested in scientific theories, but are prepared to take any advice which will bring them the balm of sleep. After discussing the sort of surroundings, the sort of people, the sort of occupation, and the manifold anxieties apart from physical disease which rob us of our sleep, the authors give amusing but none the less very sensible advice on the rooms we should sleep in, the source of light, and even the size and consistency of the bed. Persons of all ages from babyhood to old age are given sensible words of advice, and few medical men would fail to gain oddments of useful information from reading the book through.

ROYAL MEDICAL BENEVOLENT FUND.

At a recent meeting of the committee 59 grants were made, amounting to £1311. The following are particulars of a few cases helped.

Dr. X., aged 65, married. At the special request of the hon. secretary of the local British Medical Association Division an emergency grant of £10 was given, also an annual grant of £10, payable in four instalments. Owing to being crippled with rheumatism, the applicant has been unable to carry out his professional duties, and he and his wife were known to be nearly destitute and suffering from lack of food.

Widow, aged 78, of M.R.C.S. When her husband died in 1911 she went to live with her only son who had a dental practice. When the son married ten years ago his mother continued to live with him, for she had no home of her own nor the means to support one. The son died three weeks ago, and the applicant was stranded; the furniture and little else went to his widow. The applicant suffers much from chronic asthma, and at her age (78) it is impossible for her to follow any remunerative occupation. The Fund voted an annual grant of £26, and is endeavouring to obtain further help from other societies.

Widow, aged 70, of M.R.C.S. Has maintained herself since 1899 by working as a companion housekeeper. Her employer died August, 1930. She is now too old to obtain other employment and her income consists of the old age pension of £26 and a grant of £25 from the Indigent Gentlewomens Society, making £51. She feels her position very acutely, and it was only with a great deal of persuasion that she would consent to an application being made to the Committee. Fund voted £26.

Daughters, aged 76 and 69, of M.R.C.S. These two sisters who, on the death of their father in 1871, were left comfortably off, now, through the reduction of dividends, were found to be sharing a total income of £89 a year out of which they have to pay rates of £12. Fund voted annual grant of £20 to each sister.

Dr. Y., aged 75, married. Gave up practice in 1927 to undergo a serious operation from which he made a good recovery. Since then he has been doing locum work from time to time. His last employment was for 13 months, which ended in September, 1930. Since then he has been unable to find work and has been drawing on his capital, which is now reduced to £45. His wife was trying to find employment but recently met with an accident and is in hospital. Fund voted £10.

Subscriptions and donations should be forwarded to the hon. treasurer of the Fund, 11, Chandos-street, London, W.1.

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[1] Heroes of Health. By G. A. Gollock. With foreword by Sir Andrew Balfour, K.C.M.G., C.B., M.D. London: Longmans, Green and Co., Ltd. 1930. Pp. 178. 3s. 6d.

[1] Sleep. By Donald A. Laird, Ph.D., Sc.D., and Charles G. Muller. London: Williams and Norgate, Ltd. Pp. 212. 6s.

ADDRESSES AND ORIGINAL ARTICLES

THE NEUROLOGY OF OLD AGE.*

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LECTURE III.

Psychological Aspects.

ONE of the greatest problems in psychiatry concerns the nature and genesis of the various disorders of the mind associated with old age. Whether the analysis be carried out along pathological or clinical lines, it soon becomes apparent that numerous subgroupings are necessary.

In the briefest of descriptions, one may attempt some sort of classification as follows: simple senility (psychic senescence); senile dementia; arterio-sclerotic dementia; and the various presenile dementias.

A discussion of senile hysteria and other neuroses and psychoneuroses of advanced life would tempt us beyond the time at our disposal.

1. Lhermitte and Nicolas [137] apply the term *psychic senescence* to the pattern of psychological processes which is to be expected in healthy old age. The outstanding features include diminished acuity of memory, or better a loss of adherence to recent events; impaired faculty of rapid evocation of events; loss of fluidity; and weakness of creative imagination. Savage [138] adds the symptoms of restlessness and of disturbed sleep. In more severe forms, egocentricity, depression, and hypochondriacal tendencies may develop.

2. *Senile dementia* in its broadest sense may be best described in the words of the definition proposed in the manual of the American Psychological Association:

> "A well-defined type of psychosis which as a rule develops gradually, and is characterised by the following symptoms: impairment of retention (forgetfulness) and general failure of memory, more marked for recent experiences; defects in orientation and a general reduction of mental capacity; the attention, concentration, and thinking processes are interfered with; there is a self-centering of interests; often irritability and stubborn opposition; tendency to reminiscences and fabrications. Accompanying this deterioration there may occur paranoid trends, depression, confused states, &c. Certain clinical forms should, therefore, be specified but these often overlap."

These clinical variants are usually described as the confusional, maniacal, melancholic, and paranoid subtypes, in addition to the uncomplicated dementia senilis simplex.

Concerning the pathology of senile dementia, it must be admitted that there is no characteristic histological counterpart so that the diagnosis cannot be made with certainty upon microscopical examination alone. On the other hand, certain anatomical findings are commonly encountered although also occurring in conditions other than senile dementia. The characteristics of a senile brain will here be present but in a greater intensity. Brain atrophy, fatty and pigmentary degeneration, glial overgrowth are usually demonstrable to a marked degree. In particular senile plaques and Alzheimer's intracellular fibrillary changes are seen in profusion, to a much greater extent than in the brains of healthy old age. Exceptions to this general picture may be found and will be discussed more fully hereafter.

3. The *arterio-sclerotic dementias* differ radically from the senile deteriorations in ætiology, clinical aspects as well as in pathology. They do not necessarily belong to the senile age and may occur in unmistakable form in early adult life. Efforts have been made at various hands, to isolate clinical subtypes, each associated with a distinctive pathological process. Rhein, Winkelman, and Patten,[139] for instance, speak of arterio-sclerotic deterioration, progressive arterio-sclerotic psychosis, and arterio-sclerotic dementia, which they couple with a sclerosis of the larger vessels, of the smaller vessels, and of large and small vessels respectively. Other variants have been described at different times, so that such terms as "subcortical encephalitis" (Binswanger), "hypertensive encephalopathy" have arisen.

4. Scarcely any study has been made of the problem of the combination of senile with arterio-sclerotic dementia, although cases of such must actually outnumber the pure varieties. Whether the mental symptoms of cerebral arterio-sclerosis differ when they arise in youth, maturity, or old age; whether the presence of long-standing arterio-sclerosis favours the early and severe development of senile change are problems which are rarely discussed. Kraepelin, on histological grounds, has indeed suggested that arterio-sclerosis may facilitate involutional processes in the brain, and this suggestion is rather borne out by some of Grünthal's cases.

PRESENILE DEMENTIAS.

5. The various presenile dementias are very important in their possible bearing on the ætiology of the senile psychosis. Three well-defined types can be isolated—namely, Pick's disease, Alzheimer's disease, and presbyophrenia.

Pick's disease [140] is a slowly progressive dementia starting usually in the sixth decade and accompanied by focal manifestations; it is characterised pathologically by circumscribed and symmetrical areas of cortical brain atrophy.

Alzheimer's disease [141] is another example of dementia with focal signs, appearing usually between the ages of 40 and 60. The anatomical picture differs from that in Pick's disease in that brain atrophy is less intense and more generalised; the histological characteristics are those of an intense senile process greater as a rule than would be expected in a senile dement of a very advanced age.

Presbyophrenia.—This term was applied by Kahlbaum [142] to a special clinical variety of presenile dementia in which confusion, defective memory with confabulation, restlessness with euphoria, were prominent symptoms. The status of this disorder has been much discussed; some authors regard it as indistinguishable from Alzheimer's disease; others—basing their arguments upon the resemblance to Korsakow's psychosis—consider it a variety of polyneuritic mental disorder. Fischer and others believed that there was a particular pathological correlate to presbyophrenia and they associated this psychosis with the presence of senile plaques. Subsequent research has shown, however, that there is no direct connexion between this disease and the demonstration of plaques in the cerebral cortex, and indeed no clear-cut pathological picture has yet emerged.

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* The Goulstonian Lectures delivered before the Royal College of Physicians of London on March 10th, 12th, and 17th, 1931. Lectures I. and II. appeared in THE LANCET of May 23rd and June 6th respectively.

have been afflicted with a symptom of similar appearance, but developing earlier—in some members in maturity or late middle life, and in others in youth. In one family it may be possible to quote examples of each type.

Premature and Precocious Senility.

Although the problems attendant upon old age in general have been somewhat neglected, no lack of interest has been displayed concerning the premature appearances of the senile state. Indeed it has always been a topic of popular appeal especially in regard to the possibilities of treatment or prevention.

We may differentiate two chief groups of cases according to the age at which the marks of senility appear, thus "premature senility" may be applied to those examples of physical involutional changes coming on in the middle period of life, while to the rarer cases of senile appearances in youth or childhood the term "precocious senility" or "senium præcox" may be restricted.

The ætiology and manifestations of premature old age need not be detailed; the factors which seem to be important may be mentioned only. Thus, we recognise in some families an inherent resistance as it were against general involutional processes so that certain families are known to show the marks of old age at an unusually early date—just as other families are characterised by a vigorous longevity. Racial factors are extremely important and the resistance to old age changes displayed by many of the African negroes is striking. External circumstances are perhaps the most significant, however, in determining a premature senility so that a man's real age is determined less by the numerical passage of time than by the aggregate of his past illnesses. Chronic visceral disease is, in the majority of cases, an important factor in producing an early dissolution. Cardiovascular disease—and arterio-sclerosis in particular—can obviously be quoted in support of this view.

Another striking example of the premature entry of senile changes is seen in pituitary cachexia or Simmonds's[159] disease. As the result of disease of the anterior lobe of the hypophysis, there develops an extreme degree of wasting and asthenia, anæmia, loss of hair from the body and greying of the scalp hair, sexual hypoplasia, and changes in the skin, teeth, and nails. The general impression is one of advanced senility, occurring at a premature age. Other examples of endocrine disease are on record in which the premature development of senile changes is striking. Following the early descriptions by Claude and Gougnot, a syndrome of "pluriglandular insufficiency" is sometimes recognised, being characterised by cachexia, genital atrophy, stupor, depression, hypothyroidism, and premature senility.

In precocious senility we are dealing with a problem which might—if adequately studied—throw much light on the causes and processes of normal old age. Unfortunately, our knowledge of senium præcox is very meagre and is riddled with lacunes.

It is useful to distinguish three clinical subgroups—namely, (1) cutaneous geromorphism, (2) congenital ectodermal defects, and (3) progeria.

CUTANEOUS GEROMORPHISM.

Souques and Charcot,[160] in 1891, applied the term "géromorphisme cutané" to a condition in which the skin shows at a very early age the characteristics of advanced life. Thus, changes set in at puberty, whereby the skin of the face, neck, the upper thorax, and the proximal portions of the limbs become atrophic and inelastic, hanging in folds over the deeper tissues. The superficial aspect is that of an aged individual. It is noteworthy that the various cutaneous appendages remain unaltered so that there is no whitening or falling out of the hair and no changes in the teeth or nails. Nor are the viscera or the blood-vessels in any way diseased; there is merely a process of senium præcox strictly limited to the dermis over certain bodily areas.

CONGENITAL ECTODERMAL DEFECTS.

Parkes Weber[161] has familiarised us with the clinical features of the so-called congenital combined ectodermal defect, which includes various abnormalities in the hair, teeth, nails, and sweat glands. The general appearances are those of advanced senility, and other hypoplastic changes may be demonstrable at times in the skin, mammæ, bones, and sex glands.

The earliest reference to this type of case I have succeeded in tracing was made by Easton in 1799.[162] He quotes a Polish woman who died in Koninia at the age of 108. When 94 years old she married a man of 105 by whom she is said to have borne three children. In each case the infant's hair is described as grey; there was a vacuity in their gums like that which appears after the loss of teeth, though they never had any. Their backs were bent and their complexions sallow, and, in short, they presented all the other symptoms of decrepitude. The accuracy of these statements is supported—we are told—by the local parish registers.

Another early case of similar nature has been recorded by Thurnham in 1848,[163] in the *Transactions* of the Medico-Chirurgical Society.

PROGERIA.

Closely analogous to these cases of combined ectodermal defects are the instances of precocious senility supervening upon a state of infantilism. There is almost certainly a close association with the cases of ectodermal defect, and it is probable that transitional cases link up the two conditions. One of the earliest cases of this type was recorded in 1886 in the *Med.-Chir. Transactions* by Jonathan Hutchinson.[164] Under the title of "Congenital Absence of Hair and Mammary Glands, with Atrophic Condition of the Skin and its Appendages," he recorded a boy of three and a half years whose wrinkled and old-mannish appearance suggested senilism. From the account of his case one would have relegated it to the class of combined ectodermal defects, but we learn that 12 years later the same patient was studied and described by Hastings Gilford,[165] who gave the title "progeria" to this condition of premature senilism. Since that date other cases have been put on record so that we can recognise a common picture. In the general attitude and bodily conformation, in the facial appearance with the atrophic wrinkled skin and emaciation, the baldness or greying of the scalp hair, the degenerative alterations in the cardiovascular system, we see a typical case of senility in miniature.

Despite the superficial resemblances to the processes of normal old age shown by these three groups of cases we cannot, on the slender data available, pursue the analogy very far. Until we have considerably more information, especially of a pathological nature, we cannot draw any helpful conclusions. Possibly the resemblance is merely superficial and not an index of a far-reaching relationship. We need information as to the type of intercurrent illness to which these individuals are liable; as to whether such typical old age affections as senile tremor, paralysis agitans, cerebral softenings are ever encountered. Further examinations of the nervous system, as well as psychological investigations, are urgently needed in such patients.

Still more striking is the lack of pathological research in cases of senium præcox; as far as I can gather only one autopsy has been made and no histological examination of the nervous system has ever been carried out in a case of progeria. It would be obviously of value to determine whether or not the characteristic findings such as we have detailed are demonstrable in the brain and spinal cord; whether senile plaques or Alzheimer's intracellular changes are present or not. On these points one must simply wait for information which would probably throw light upon the nature of so-called physiological old age.

One final point arguing that the analogy between precocious senility and normal old age is not far-reaching, lies in the traits of infantilism which are demonstrable in the former. The child with progeria is not so much one which has run through the gamut of the years with astonishing rapidity, but rather one who has, in some respects, never grown up. In many ways the patient has skipped an epoch or a decade. These are points which are readily demonstrable clinically—not only in the physical examination but also in the execution of the Binet-Simon intelligence tests. From an anatomical standpoint they have been demonstrated by Keith[166]; from his most detailed study of the skeleton of an individual dying at the age of 18 of progeria, he was able to point out that most of the osseous abnormalities betrayed a state of infantilism while others were the index of a premature development.

Relationship of Arterio-sclerosis to Senescence.

When one considers the various neurological syndromes common in old age, it is found that many of them can be directly attributed to lesions of the cerebral blood-vessels. Thus, the hemiplegias and paraplegias of old age, possibly also senile tremor and epilepsy, are associated with areas of ischæmia within the central nervous system. Possibly some of the minor signs of so-called healthy old age—such as alterations in the tendon reflexes, loss of vibratory sensibility, slowness of movement, inelasticity of gait, and so on—are also produced by slighter degrees of chronic malnutrition.

Even when there is no macroscopical evidence of arterio-sclerosis or concomitant lesions, it is at least possible that a condition of capillary fibrosis may exist causing a prolonged circulatory inadequacy. It might also be suggested that no primary neuronic decay can be recognised in the senile brain which is strictly independent of vascular degeneration.

Can we extend this conception and argue that the ageing of the nervous system depends upon vascular deterioration? In other words, is Cazalis's aphorism . . . "a man is as old as his arteries" strictly true? If this view is correct, then the symptomatology of cerebral arterio-sclerosis should be identical with that of senility. There should exist no senile manifestation which is not also seen in cerebro-vascular disease, and, conversely, no sign or symptom in the arteriopath which may not also occur in the aged. Moreover, this parallelism would be independent of the age of the individual, and we should expect the marks of senility in the arterio-sclerotic of middle life. This, of course, is not altogether the case. In those rare cases of senile vascular disease in childhood (Hughes and Perry[167]) there is not necessarily a precocious senility. There are numerous differences between the clinical aspects of the aged and the arteriopathic, although the superficial resemblance may be great. The psychiatrist will confirm this in pointing out that arterio-sclerotic dementia and senile dementia are not identical.

Pathological study of the brain in cases of diffuse cerebral arterio-sclerosis emphasises the distinction. We do not encounter senile plaques, Alzheimer's tangles, diffuse parenchymatous atrophy with pigmentary degeneration of the nerve-cells unless the individual happens to have been aged as well as arterio-sclerotic. The histology of the two conditions is distinct.

In theory, therefore, there are two separate conceptions, the neurology of old age and the neurology of cerebral arterio-sclerosis, each with its own clinical picture, and its own pathology. We must imagine a hypothetical senile brain without vascular disease, just as we often see arterial degeneration in the brain of a young subject.

At the same time we must admit that the distinction is more academic than practical, since in the great majority of cases the processes of ageing operate simultaneously on both parenchyma and blood-vessels of the brain.

Nature of Old Age Considered from a Neurological Standpoint.

From earliest times writers on the subject of old age have debated whether involution and decay are to be regarded as physiological or pathological processes. It may be convenient to approach this question from the viewpoint of the neurologist and to determine what light is afforded by a study of the senile nervous system.

The argument of those who maintain that old age is an inevitable and essentially normal phenomenon, can be stated in the words of Prof. Warthin[168]:—

> "The senescent process is potent from the very beginning," he says . . . "involution is a biologic entity equally important with evolution . . . . its processes are as physiologic as those of growth . . . . It is, therefore, inherent in the cell itself, an intrinsic, inherent, inherited quality of the germ plasm, and no slur or stigma of pathology should be cast upon this process . . . . Senescence is due primarily to the gradually weakening energy charge set in action by the moment of fertilisation."

Or, to quote Prof. Marinesco[169]: " . . . All living matter obeys the universal law of evolution. . . . Cells appear, multiply, increase, decay, and die."

Instances of longevity occurring in certain families or in particular races support this view, and suggest that there is normally a certain expectation of life which in exceptional cases is extended a little. Ophthalmologists tell us that the crystalline lens of the eye diminishes in elasticity with advancing years. This constant and slowly progressive change commences in the second decade of life, indicating that involution sets in at a very early date.

The opposing view regards old age as a disease in itself, and looks upon the senile histological changes in the various organs as evidences of multiple traumata. These represent scars, as it were, indicating the ravages of previous infections, disease, toxins, faulty habits, and so on. Such an opinion is centuries old; Cicero[170] declared "that every decay and strength (in old age) results more often from the vices of youth than from age, for a licentious and unbridled youth bequeaths a worn-out constitution to old age." Sir Clifford Allbutt[171] said: "In medicine we do not count the ages of people by the revolutions of the earth around the sun, but we measure them by the revolutions of their own morbid processes."

Metchnikoff has familiarised the laymen with this hypothesis, but one of the most eloquent advocates of this view is Prof. Tilney.[172] In a recent and most inspiring address he takes up the standpoint that the old brain is actually a diseased brain.

> "No evidence thus far adduced," he says "is sufficient to convince us that there is such a thing as a strictly old brain. The brain in aged people may present certain morbid changes, but these are in their turn incident to many pathological assaults upon the tissues sustained during life which, in some individuals more, in others less, are in all alike the consequence of infections, intoxications, or other morbid influences . . . All of this is a strong argument in favour of the theory which holds old age in the brain, as in other organs, to be the result of life's successive and cumulative intoxications," and later . . . . "According to this view, old age has a pathological background. It arises from definite conditions which may be combated or corrected."

I have stated the two divergent viewpoints and have quoted freely from the opposing advocates. As in most cases where opinions are diametrically opposed, the truth is probably a compromise between the extremes. Even if it be true that the "aged brain is one which has been diseased, abused, or neglected" (Tilney), one must admit a limited span of life to every living cell and organism. Otherwise a perfect prophylactic régime, capable of excluding every noxious influence, would confer immortality. Almost certainly the two factors are mutually operative, the inherent span of existence and the devastating influence of exogeneous factors.

It is impossible at present to decide which factor is the more powerful. An investigation into cerebral pathology offers, however, a hope of throwing some light upon this problem. I would suggest three avenues along which research might be helpful.

(1) Certain pathological features which are commonly held as characteristic of old age—such as senile plaques, Alzheimer changes, axonal swelling of the Purkinjé cells—are very occasionally seen in the brains of young subjects. These exceptional cases should be studied with the greatest care as suggesting that these so-called "senile changes" are merely the index of a particular type of tissue reaction.

(2) The tissue reaction of the senile brain to known toxins should be studied and compared with the response of a mature tissue against the same toxin. A comparison, for example, of the histology of general paralysis of the insane in the adult, in the child and in the aged, offers an admirable opportunity of contrasting the reactions of a mature, immature, and senile tissue respectively.

(3) Further histological examinations should be made of the brains of normal old people and comparison made with the changes in senile dementia. The object of this should be to determine, not how much histological change is present, but how little. It is highly important to discover the minimum change that can be encountered in the brain of a healthy centenarian.

It may be asked whether such investigation is worth while or if the problem is not merely academic. The research is essentially practical in its bearings, for by determining which histological features are indicative of exogenous influence and which are the expression of a simple involution, the date of onset of old age may be determined. The span of life may well prove to be far beyond the estimate of the Psalmist, as judged by the inherent viability of the tissues. Moreover, by determining the exact part played by external influences in shortening life, steps may be essayed to prevent or to counteract these factors. Old age, in fact, may be the result of two processes, one endogenous and inevitable and the other exogenous and avoidable. Histological research may determine the importance of the latter.

It is interesting and somewhat chastening to recall that this was precisely the conclusion arrived at by Andreas Laurentius.[173] In 1599 he wrote . . . "The causes of our dissolution are either inward, or outward: the inward are borne with us, abide with us dailie, and accompanie us even to the grave. The outward doe spring and rise from without, compasse us on every side, and though a man may keepe himselfe from some few, yet there are an infinite number besides, which cannot be avoyded. Those which are borne and bred with us are two, the contrariettie of the elements, whereof our bodies are framed, and the working of our own naturall heate."

I may perhaps be allowed in conclusion to quote from Tilney once more: "Some day, people will awaken to the fact that they have been missing the greatest constructive opportunities. . . One liberally supported and effective brain institute would prove an incomparably more profitable investment for civilisation than the most powerful battle-fleet that ever sailed the seas. The political party which will have the foresight and humanity to introduce into its platform an article advocating and supporting the longer and better use of the human brain will offer a worthy issue to its electorate."

I beg to acknowledge my indebtedness to Dr. P. M. Turnbull, the medical superintendent, and to Dr. C. J. C. Earl, late assistant medical officer of Tooting Bec Mental Hospital, for their unfailing kindness in permitting me to visit their wards and to examine their valuable pathological material; to Dr. W. D. Wiggins, Dr. Humphrey Nockolds, and Dr. N. S. Craig, of St. Alphege's Hospital, Lewisham Hospital, and St. Mary Abbott's Hospital. My grateful thanks are due to the Commissioners of the Royal Hospital, Chelsea, for their kind permission to visit their patients, and to the medical officers, Major E. A. Strachan and Major F. M. Lipscomb, for their constant assistance. To Dr. J. G. Greenfield and my other colleagues at Queen-square I am indebted for encouragement and advice. To the courtesy of Prof. J. Lhermitte of the Hospice Paul Brousse, Paris, and of Prof. P. Schuster of the Hufeland Hospital, Berlin, I am under deep obligation, for permitting me to work in their valuable clinics. My gratitude is to be extended to the Medical Research Council who have defrayed the cost of my work.

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(Continued at foot of opposite page.)

ON ACUTE RHEUMATISM FOLLOWING TONSILLITIS.

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FOR many years it has been recognised that there is a close association between infection of the throat nd acute rheumatism—that is to say, acute rheu-atic inflammation of the heart or joints. An nportant contribution to this subject has recently een made by Schlesinger,[1] who in a series of 22 hildren under his care at the West Wickham Con-alescent Heart Home made the observation that a efinite interval intervenes between the onset of a roat infection and the reappearance of acute eumatic symptoms—an interval of approximately 0-21 days. During this interval the throat symptoms ibside and the child seems to have made a complete ecovery from the throat infection, but this is shown ot to be the case when in two or three weeks fresh eumatic manifestations arise. A proper under-anding of the changes that are taking place in the hild during this "silent" interval would almost rtainly reveal much of the pathogenesis of rheumatic eart disease.

Sore-throats in Two Institutions.

One of the advantages of a convalescent home over hospital is that the patients can be kept under edical observation for periods extending over any months, and incidental sore-throats and their sequelæ can be studied. In the ordinary hospital children are not admitted to the wards because of sore-throats, and generally do not come under observation until the rheumatic inflammation which follows the sore-throat has already developed. Furthermore, the throat infection is often a mild affair; there may be no complaint of sore-throat, and only the fact that the temperature rises two or three degrees for a day or two for no obvious cause leads to an examination of the throat. These mild pyrexias would usually be missed at the child's own home, but at a convalescent home the daily temperature record directs the attention of the doctor to them.

During the last two years the opportunity has arisen of observing children with rheumatic heart disease over prolonged periods. This has been possible at the Cheyne Hospital for Children, Chelsea, where one ward of 25 beds has been devoted to cases of this nature, and also at the Lancing Convalescent Heart Home, where the 60 beds are filled from the rheumatic clinic at the Hospital for Sick Children, Great Ormond-street, with cases of early and mild cardiac rheumatism. During this period 34 children have suffered from sore-throats or rheumatic relapses at these two institutions, and the salient features of these cases are presented in the Table.

Before proceeding to analyse the contents of this Table, that part of the history of the first case which is germane to this paper will be given in more detail, since it affords a good example of a rheumatic relapse following upon a sore-throat.

CASE 1 was a boy, aged 11 years, who when 8 years old had rheumatic fever, followed by aortic and mitral disease. His tonsils had been thoroughly enucleated some time before his attack of rheumatic fever. He was admitted to the Cheyne Hospital when 10 years old, and made steady progress, so that by February, 1929, he was getting up preliminary to going home. On March 4th he complained of a sore-throat and had a temperature of 102° F. The routine throat-swab for diphtheria bacilli proved to be negative, and the temperature settled back to normal in 24 hours. The boy remained quite well for a fortnight, but on March 18th the temperature rose again, and four days later pericardial frictions became audible. The boy's condition steadily became weaker, and he died on April 2nd. The temperature and pulse chart is reproduced (Fig. 1) in order to demonstrate the evanescence of the sore-throat, and the apparently normal period which followed for two weeks before the onset of the fatal pericarditis.

Returning to the Table, the first 29 cases comprise all the instances of sore-throat which have arisen at the Cheyne Hospital during the last two years, and also all the cases of rheumatic relapse at that hospital, whether or not they were preceded by clinical evidence of sore-throat. Of these 29 cases, 19 suffered from a rheumatic relapse which was preceded in 14 instances by a brief febrile disturbance, lasting as a rule about 48 hours, and occurring at an interval which varied from 9 to 25 days before the rheumatic relapse. This preliminary febrile disturbance I have called the "initial fever." The initial fever was accounted for in five cases (6, 9, 14, 24, 27) by follicular tonsillitis, in five others (1, 7, 19A, 20, 29) by a sore and reddened throat, while in four cases (4, 5, 10, 28), although an initial fever occurred, no obvious cause could be found on clinical examination to account for it. Of the remaining five children who suffered from an acute rheumatic relapse, three (8, 13, 21) began their relapse by suffering from a sore-throat, but the rheumatic relapse occurred synchronously with the throat infection. In one child (23) the relapse consisted of the development of rheumatic nodules five weeks after the initial fever due to sore-throat, but this child received aspirin grs. 30 daily for a month after the sore-throat, and as will be shown later the

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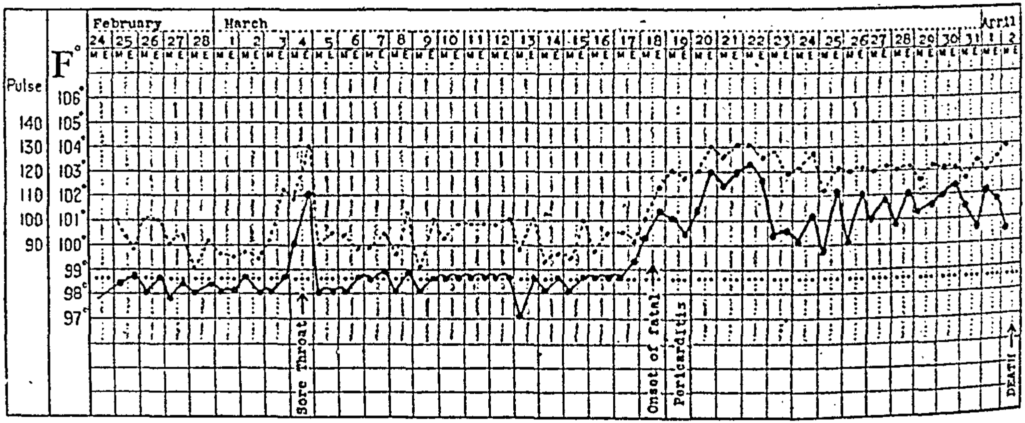
use of this drug may have delayed the relapse or so modified it as to make it uncertain how long after the initial fever the rheumatic relapse began to develop. The other child (Case 25) suffered from a relapse of rheumatic pancarditis, which proved fatal, but in her case there was no initial fever nor any evidence of infection of her throat. Except for the fact that this child's last illness happened while several other children in the ward were suffering from an epidemic of sore-throat, her rheumatic relapse seemed to arise without cause.

The last five cases of the Table are children who had sore-throats while at the Lancing Heart Home. Three of these children experienced an acute rheumatic relapse which began 14, 18, and 24 days respectively after the initial fever.

Analysis of the 34 children in the Table supports Schlesinger's observation that if a child has already had a rheumatic infection, then the occurrence of an acute infection of the throat is likely to be followed by a rheumatic relapse in roughly 10 to 21 days.

FIG. 1.



Temperature and pulse chart in Case 1. (Mitral stenosis and aortic regurgitation. Tonsils removed.)

With the exception of the three cases in which rheumatic relapse coincided with the throat infection, the silent period between the initial fever and the rheumatic relapse lay, in my cases, between 9 and 25 days. It is interesting to note in passing that of the 44 instances of acute rheumatic relapse compiled from Schlesinger's cases and those in this paper, not once did the relapse after the throat infection take the form simply of chorea, an observation which suggests that although throat infection is a factor in the production of rheumatic carditis and arthritis, it is of less importance in producing chorea.

Tonsillectomy and Rheumatic Relapses.

In the third column of the Table is set out the state of the tonsils before the initial fever took place, and it will be seen that relapses occurred whether the tonsils had been removed or not. Of the 19 children at the Cheyne Hospital who suffered a rheumatic relapse, 6 (31 per cent.) had previously undergone complete tonsillectomy, 2 (11 per cent.) had obvious tonsillar remnants, and the remaining 11 (57 per cent.) had not had their tonsils operated upon. These percentages may be compared with those obtained from an analysis of the throat condition in all the rheumatic children admitted to Cheyne during the last two years. During this period 89 children have been admitted; of these, 30 (33 per cent.) had previously undergone complete tonsillectomy, 7 (9 per cent.) had obvious tonsillar remnants, and 52 (58 per cent.) had not had their tonsils operated upon. Although the number of children is small, the percentages approximate so closely that the evidence seems to indicate that previous tonsillectomy is of no value as a safeguard against rheumatic relapses.

Aspirin as a Prophylactic against Relapses.

It is well known that an injection of horse serum in man may be followed in ten days or so by the appearance of serum sickness, the symptoms including urticaria and a transient non-suppurative arthritis. Derick, Hitchcock, and Swift[2] have shown that if aspirin or neocinchophen (Tolysin) is given in sufficient amount over a period of ten days or so immediately following the administration of horse serum, the subsequent serum sickness can be modified to the extent of preventing the arthritis, although the urticaria is not affected. The dose of aspirin employed amounted to 5 or 6 g. daily—a dose which would be very large for an adult, and certainly more than one would give to a child. The explanation which the authors advance is that the antirheumatic drugs prevent the formation of *circulating* antibodies normally produced by the presence of a foreign serum, the arthritis of serum sickness being held to be due to the clash between these two substances. The urticaria is not affected because it is due, not to *circulating* antibodies, but to antibody produced within the reticulo-endothelial cells of the skin.

An analogy between the administration of serum and the development of serum sickness on the one hand, and sore-throats and rheumatic relapses on the other hand has been drawn by Schlesinger, and following the work of Derick, Hitchcock, and Swift, he has attempted to prevent rheumatic relapses by giving aspirin as soon as the sore-throat has appeared, continuing the drug for a month or so. In 16 cases of tonsillitis in rheumatic children treated in this way, he states that no serious rheumatic relapse followed.

Hoping for the same beneficial results from aspirin, the drug has been given to seven rheumatic children at Cheyne, beginning its administration as soon as the initial fever and sore-throat appeared. The dosage and duration of administration of the drug are

Table showing the Relationship between "Sore-throats" and Rheumatic Relapses in 34 children, all of whom had already shown evidence of rheumatic infection. Cases 1 to 29 occurred at the Cheyne Hospital, Chelsea, and Cases 30 to 34 at the Lancing Convalescent Heart Home. Cases 1, 9, 10, 6, and 7 have previously been quoted in Schlesinger's article (Arch. Dis. Child., 1930, v., 411).

Case	Previous heart condition and duration.	Condition of tonsils before relapse.	(a) Date, (b) cause of, and (c) treatment after initial fever.	Days before relapse	Date of onset and nature of rheumatic relapse.	Case
1	Mitral stenosis; aortic regurg. (3 y.).	*Removed.*	*(a) 4/3/29. (b) Sore-throat.*	*14*	*17/3/29. Pericarditis (fatal).*	1
2	Mitral regurg. (7 y.).	Enlarged, septic.	(a) 1/4/29. (b) Follicular tonsillitis.	—	—	2
3	Mitral regurg.	"Removed" remnants.	(a) 25/4/29. (b) Sore-throat.	—	—	3
4	Mitral regurg. (18 m.).	Enlarged, septic.	(a) 12/5/29. (b) Temp. 99·5°. ? cause.	20	31/5/29. Pericarditis.	4
5	Same case as 3.	—	(a) 1/6/29. (b) Temp. 102°. ? cause.	14	14/6/29. Rheumatic arthritis.	5
6	Mitral regurg.	Healthy.	(a) 3/6/29. (b) Follicular tonsillitis.	17	19/6/29. Pericarditis (fatal).	6
7	Mitral stenosis (4 y.).	Removed.	(a) 7/10/29. (b) Sore-throat.	21	27/10/29. Pericarditis (fatal).	7
8	Mitral and aortic regurg. (5 y.).	Tonsils small.	(a) 11/10/29. (b) Throat red, no exudate.	0	Rheumatic arthritis from 11th until 18th.	8
9	Mitral stenosis (4 y.).	Enlarged, septic.	(a) 11/10/29. (b) Follicular tonsillitis.	19	29/10/29. Arthritis and *cardiac dilatation. Nodules,* Nov. 26th.	9
10	Mitral regurg. (6 m.).	Removed June, 1929.	(a) 17/10/29. (b) Temp. 102°. ? cause.	21	6/11/29. Carditis.	10
11	Mitral regurg. (6 m.).	Removed 1927.	(a) 14/11/29. (b) Throat sore, red. (c) Aspirin grs. 10 bis die, 28 days.	—	—	11
12	Mitral regurg. (3 y.).	Enlarged, septic.	(a) 15/11/29. (b) Throat sore, red, no exudate.	—	—	12
13	Same case as 12.	—	(a) 9/2/30. (b) Throat red, mucopus in pharynx. (c) Aspirin grs. 10 ter die, 8 days, then grs. 5 ter die for 6 weeks.	0	Pericarditis synchronous with sore-throat.	13
14	Mitral regurg. (2 y.).	Big tonsil remnants.	(a) 28/2/30. (b) Follicular tonsillitis. (c) Aspirin grs. 10 ter die, 28 days.	12	11/3/30. One day of fever to 100° F. Aortic regurg. appeared 4 weeks later.	14
15	Mitral regurg. (2 y.).	Small, healthy.	(a) 2/3/30. (b) Throat sore, red, no exudate. (c) Aspirin grs. 5 bis die, 28 days.	—	—	15
16	*Same case as 15.*	—	(a) 21/4/30. (b) Follicular tonsillitis. (c) Aspirin grs. 5 ter die, 28 days.	—	—	16
17	Mitral and aortic regurg. (18 m.).	Enlarged, clean.	(a) 7/6/30. (b) Temp. 102° F. Throat red and sore.	—	—	17
18	Mitral regurg. (5 y.).	Removed.	(a) 23/8/30. (b) Temp. 101° F. Throat red and sore.	—	—	18
19	Mitral regurg. (9 m.).	*Healthy.*	*(a) 11/10/30. (b) Tonsillitis.*	—	*Second attack. Tonsillitis in* 21 days. (Vide Case 19A).	19
19A	Same case as 19.	—	(a) 31/10/30. (b) Second attack. Tonsillitis.	16	15/11/30. Pericarditis.	19A
20	Mitral regurg. (9 m.).	Small, healthy.	(a) 11/11/30. (b) Tonsillitis.	15	25/11/30. Pericarditis, gross dilatation.	20
21	Mitral stenosis (4 y.).	Small, healthy.	(a) 18/11/30. (b) Follicular tonsillitis.	*0*	*Continuous illness from 18th* until 4/12/30: fatal myocarditis.	21
22	Mitral regurg. (3 y.).	Small, healthy.	(a) 22/11/30. (b) Throat red and sore.	—	—	22
23	Mitral stenosis (3 y.).	Removed.	(a) 26/11/30. (b) Sore-throat. Pus in tonsil beds. (c) Aspirin grs. 10 ter die for 28 days.	?	Off aspirin 24/12/30. Nodules appeared 29/12/30. No active carditis.	23
24	Mitral stenosis (3 y.).	Small, healthy.	(a) 1/12/30. (b) Follicular tonsillitis. (c) Aspirin grs. 10 ter die, 24 days (tendency to vomit after aspirin).	11	11/12/30. One day's fever on 11th. Followed in two weeks by fatal pericarditis.	24
25	*Mitral regurg. (4 y.).*	*Removed.*	—	—	6/12/30. Onset of fatal carditis, with pericarditis. No initial fever.	25
26	Same case as 14.	—	(a) 7/12/30. (b) Follicular tonsillitis.	—	—	26
27	Mitral stenosis (6 y.).	Enlarged.	(a) 11/12/30. (b) Follicular tonsillitis.	14	24/12/30. Carditis and ? rheumatic pneumonia. Fatal.	27
28	Same case as 15.	—	(a) 21/12/30. (b) Temp. to 101° F. ? cause.	9	1/1/31. Carditis. Developed aortic regurg.	28
29	Mitral regurg. (3 y.).	Removed.	(a) 8/1/31. (b) Temp. 102° F. Throat red.	25	1/2/31. Fever and pains in arms.	29
30	Nil cardiac, old chorea.	Healthy.	*(a) 23/2/29. (b) Tonsillitis.*	18	12/3/29. Fever and myocarditis.	30
31	Mitral and aortic regurg. (2 y.).	Removed.	(a) 25/10/29. (b) Sore-throat.	24	18/11/29. Carditis.	31
32	Chorea, nil cardiac.	Enlarged, septic.	(a) 17/3/30. (b) Tonsillitis.	—	—	32
33	Chorea, nil cardiac.	Small, healthy.	(a) 19/11/30. (b) Follicular tonsillitis.	—	—	33
34	Mitral regurg. (6 y.).	Small, healthy.	(a) 20/11/30. (b) Follicular tonsillitis.	14	3/12/30. Urticaria over elbows and ankles then carditis.	34

y. = years; *m. = months*

shown in the fourth column of the Table. In Case 13, although aspirin was given at the onset of the sore-throat, rheumatic pericarditis developed at the same time as the tonsillitis, leaving no time for the aspirin to prevent the rheumatic relapse, and this case may therefore be disregarded. Case 24 was generally sick once a day while on aspirin, and probably did not absorb more than about two-thirds of the amount of aspirin given in the 24 hours, but with that exception the drug was tolerated perfectly well.

In three children (Cases 14, 23, 24) aspirin seemed to modify the rheumatic relapse, but did not prevent it. Thus in Case 14, pyrexia appeared for 24 hours on the twelfth day after the beginning of aspirin therapy; otherwise this child seemed to have avoided a relapse, but within a fortnight of the discontinuance of aspirin it became evident that the aortic valve was affected, and it is probable that the rheumatic process was attacking the aortic valve while the child was under the influence of the drug. In Case 23 no signs of rheumatic relapse appeared while aspirin was being given, but five days after the drug was stopped rheumatic nodules were found—the child had been under observation for six months previously and had never had nodules. In Case 24 pyrexia appeared for 24 hours on the eleventh day of aspirin therapy, and a fortnight later, while still receiving aspirin, the child developed rheumatic pericarditis, which proved fatal.

Three of the "aspirinised" children (Cases 11, 15, 16) remained free from rheumatic relapse after their initial fever. It must, however, be pointed out that in nine other children (Cases, 2, 3, 12, 17, 18, 22, 26, 32, 33), although no antirheumatic drug was employed, the sore-throat was not followed by a rheumatic relapse. From these few cases it is impossible to draw a conclusion. It may be that those children who relapsed after receiving aspirin did not receive a large enough dose of the drug. The first indication of the beginning of a relapse is a rise of temperature and pulse-rate, but in the aspirinised children the temperature remains at about 97° F. even in the face of acute rheumatic carditis. The temperature chart in these cases may lull one into a sense of false security, later events showing that while the child was under the influence of aspirin the rheumatic lesion was progressing. The prophylaxis of rheumatic relapses, by giving a course of aspirin after sore-throats, seems to offer a promising field of research.

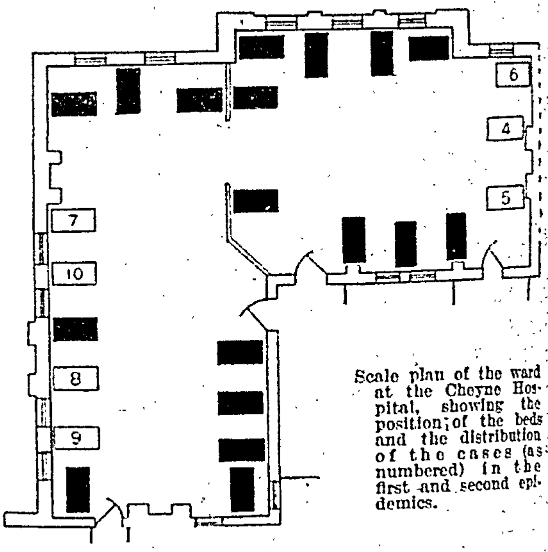
Epidemics of Sore-throat and Rheumatic Relapses.

The cases in the Table have been tabulated in the chronological order of the initial fever, in order to demonstrate that sometimes the initial fevers and the rheumatic relapses constituted small epidemics.

The first epidemic at the Cheyne Hospital was composed of Cases 4, 5, and 6. Case 4 developed a temperature on May 5th, 1929, and began pericarditis on May 31st. On the next day the child in the next bed (Case 5) developed a temperature of 102° F. for 24 hours, and two days later, on June 3rd, the child in the bed on the other side of Case 4 developed tonsillitis (Case 6). Case 5 went on to suffer from acute rheumatic arthritis, and Case 6 from fatal pericarditis. Fig. 2 is a scale plan of the ward at Cheyne and shows the position of the beds. It can be seen that in this first small epidemic the affected children were congregated closely together.

A second similar epidemic occurred in October, 1929, affecting Cases 7, 8, 9, and 10. Case 7 began a sore-throat on Oct. 7th, and died from a relapse of pericarditis. Four days later, on Oct. 11th, Cases 8 and 9 developed sore-throats, followed by acute rheumatic arthritis, and in Case 9 by carditis as well. Six days later, on Oct. 17th, Case 10 had pyrexia, and three weeks later was ill with acute carditis. The beds which these four children occupied are indicated in Fig. 2, and it can be seen that they were in close proximity to each other. Judging from the proximity of the children in each of these little epidemics, it seems likely that an organism, responsible for the sore-throat, was passing from child to child, conveyed possibly by droplet infection with or without the aid of a carrier.

FIG. 2.



Scale plan of the ward at the Cheyne Hospital, showing the position of the beds and the distribution of the cases (as numbered) in the first and second epidemics.

One year after the second epidemic, on Oct. 11th, 1930, Case 19 developed tonsillitis, which recurred on Oct. 31st. During the next two months ten other children suffered from pyrexia with clinical evidence of acute throat infection, giving rise to a somewhat protracted epidemic. Of these 11 children, in eight the throat infection was followed by an acute rheumatic relapse. The bacteriology of the preliminary throat infection was investigated by Dr. W. R. F. Collis, whose paper is published with this one, but it may be mentioned here that an organism common to all the 11 cases was obtained from the throat cultures. The same organism was also recovered from a nurse who developed follicular tonsillitis on Nov. 21st, three weeks after the epidemic had commenced. It is likely that she acted as a carrier of the organism, since the children affected after she was taken ill were scattered throughout the ward.

Papers describing epidemics of acute rheumatism have appeared from time to time, and are summarised in a paper by Boas and Schwartz [3] in 1927. Grenet[4] as a result of his experiences in five epidemics in the French forces during the war, concluded that acute articular rheumatism was a contagious disease. Hiller and Graef [5] described an epidemic occurring in a convalescent home for rheumatic children near Chicago in 1927. In the Milroy lectures in 1930, Glover [6] adduced evidence to show that acute rheumatism could be regarded as an infectious disease, the virus being conveyed by droplet infection.

Evidence has been advanced in this paper to show that acute rheumatic relapses are often preceded at a definite interval by sore-throats, and that the sore-throats may sometimes assume epidemic characters.

It is the preliminary sore-throat which properly should be regarded as the infectious element in acute rheumatism, the sore-throat spreading from case to case probably by droplet infection; but the development of acute rheumatism after the initial throat infection appears to depend upon some altered condition of the individual which enables products from the sore-throat to set going an acute rheumatic reaction. The rheumatic reaction, whether arthritic or cardiac, has no more claim to be considered infectious than has, for example, post-diphtheritic paralysis.

Conclusions.

(1) Relapses of acute rheumatic arthritis or carditis are often preceded by an initial fever—usually demonstrably due to nasopharyngeal infection—at an interval of one to four weeks beforehand. Occasionally the rheumatic relapse occurs synchronously with the throat infection. (2) The removal of the tonsils does not influence the likelihood of a rheumatic relapse. (3) The use of aspirin as a prophylactic measure against rheumatic relapses after throat infections is mentioned. Further investigation on this point is required. (4) The element of infectiousness in acute rheumatism lies in the preliminary throat infection, and these throat infections may assume epidemic proportions.

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ACUTE RHEUMATISM AND HÆMOLYTIC STREPTOCOCCI.

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IN 1900 Poynton and Paine[1] isolated a streptococcus from the throat of a patient suffering from acute rheumatic fever accompanied by tonsillitis and with this organism produced experimental arthritis. This pioneer work served to emphasise the association between acute rheumatic fever and throat infection, but it is only recently that this association has been studied from the epidemiological point of view. Glover,[2] in his Milroy Lectures of 1930, described various epidemics of tonsillitis and rheumatic fever in semi-isolated communities at Army and Air Force establishments. He showed that the peaks of the tonsillitis epidemics were followed after some two weeks by the peaks of the rheumatic fever epidemics. At Halton, out of a total strength of 3530, 427 boys got acute tonsillitis, and of these 41 showed subsequent symptoms of acute rheumatic fever. He found that there was a correlation between overcrowding, tonsillitis, and rheumatic fever.

Schlesinger,[3] while in charge of a large group of rheumatic children at the West Wickham Home during the last few years, has made some very important and original observations on the epidemiology of acute rheumatism. Each winter an epidemic of nasopharyngeal infection occurred in the wards of this home among the convalescent children. Recovery from these attacks of sore-throat was apparently complete, but after a "silent" period of 10–21 days a certain percentage (36 per cent.) of cases developed acute rheumatic cardiac relapses. It was observed also that if aspirin was given in large doses at the time of the initial sore-throat and continued for some weeks subsequently relapses did not occur.

Sheldon (in the paper preceding this) confirms the general principles of these observations. He describes similar epidemics of sore-throat which have occurred among rheumatic children in different convalescent homes, and has noted in most of his cases the same silent period before the appearance of rheumatic symptoms.

Tonsillitis has long been recognised as an important factor in the ætiology of acute rheumatism, and it has been surmised that the tonsil is one of the principal foci of entry of the rheumatic virus. Though the hæmolytic streptococcus is the chief cause of acute tonsillitis the possibility of this organism being associated with rheumatic fever was not definitely raised until Coburn's[4] work appeared in January of this year, though Dr. F. Griffith[5] investigated in April, 1930, an outbreak of tonsillitis at a public school which was followed in several instances by primary acute rheumatism. Griffith found that a hæmolytic streptococcus of a well-defined serological type was responsible for the cases and suggested (private communication) that there might be direct ætiological connexion between this streptococcal infection and rheumatic attacks. There were various causes which tended to divert suspicion from the hæmolytic streptococcus. Owing to what has been referred to as the silent period between the throat infection associated with rheumatic fever and the subsequent development of rheumatic cardiac symptoms, most cases of acute rheumatism reaching the hospital no longer show any demonstrable throat infection, nor does a bacteriological examination as a rule reveal a preponderating growth of the causal organism of the previous throat infection. (I have, however, been able to demonstrate the presence of the hæmolytic streptococcus in the throats of over half the rheumatic children who have been admitted to the Hospital for Sick Children, Great Ormond-street, during the past few months.) Moreover, the throat infection may be slight and give rise to few general symptoms, so that no history of tonsillitis or sore-throat is obtained from the parents. Swift,[6] writing in 1926, recognised this difficulty in studying the cause of the throat inflammations generally spoken of as associated with acute rheumatic infection.

The recognition of the full significance of the silent period and the provision of special homes for rheumatic children have recently facilitated investigations in this country. That these investigations have not hitherto implicated the hæmolytic streptococcus may be attributed to the fact that attention was generally focused on organisms found irregularly in the blood of patients with acute rheumatism, such as the various types of non-hæmolytic streptococci. In consequence work on throat cultures has been directed largely to search for similar organisms associated with the tonsillitis, &c.

Hitchcock,[7] in New York, and Nabarro and MacDonald[8] in London, studied throat cultures from rheumatic children, not at the time suffering from acute upper respiratory infections, and failed to find any one type of *viridans* or other non-hæmolytic streptococcus predominating in the throats of

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* Supported by the Mrs. Sebag-Montefiore research scholarship with an additional grant from the Medical Research Council.

rheumatic cases. In a series of epidemics at the West Wickham Home, Schlesinger made throat cultures at the time of the initial sore-throats and reported as follows :—

> "During the 1927 epidemic special search was made for the streptococcus which Birkhaug has reported to be so frequently present in the throats of rheumatic children . . . we were unable to isolate this organism. It was noticed that many of the streptococci were hæmolytic on blood-agar plates and the rest, cultured on boiled blood-agar, were chiefly of the *viridans* type commonly found in the throat."

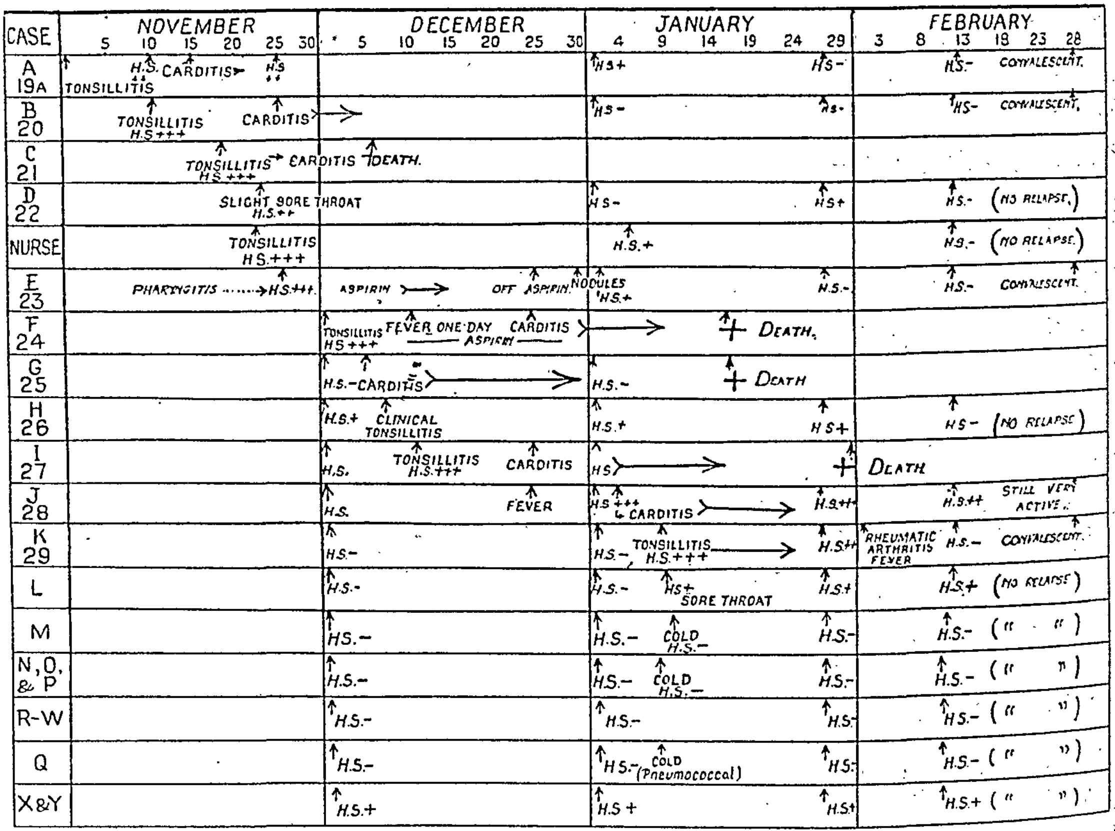

Chart showing incidence of rheumatic relapses and association of hæmolytic streptococcal infection during an outbreak of tonsillitis among rheumatic children in a ward at the Cheyne Hospital from November, 1930, to February, 1931. The 25 children in the ward are here called A to Y, but the 11 cases A to K are those numbered 19A to 29 in Table I. of Dr. Wilfrid Sheldon's paper, published herewith. H.S. = hæmolytic streptococci obtained from throat swab; + + + = pure culture; + + = fairly numerous colonies; + = sparse colonies; − = no colonies on plate.

In later epidemics similar results followed similar procedure, and Schlesinger came to the conclusion that no causal organism could be associated with these epidemics. He himself, however, regarded them as epidemic clinically, since "infection" appeared to spread from case to case. Though its possible significance was not recognised, the fact that hæmolytic streptococci were observed to predominate in the cultures where blood-agar was used suggests that this organism was responsible.

Present Investigation.

This investigation deals with the bacteriology of an outbreak of tonsillitis in Dr. Wilfrid Sheldon's ward for rheumatic cases at the Cheyne Hospital for Children. Its clinical aspect is described in Dr. Sheldon's communication.

The first case of tonsillitis was observed on Oct. 31st, 1930, and the bacteriological investigations were begun on Nov. 10th, when the second case appeared. Subsequent cases occurred at intervals during the months November to February inclusive, a detailed study of the throat flora being undertaken during this period. Throat swabs were obtained at definite intervals from every child, irrespective of its clinical condition at the time, and a more intensive investigation was made of the children who were affected by the serious outbreak of throat infection which was associated in almost every case with subsequent acute rheumatic relapse.

The results of this study are set out in the accompanying chart. Only the presence or absence of hæmolytic streptococci is indicated, except in the case of a group of colds which were of pneumococcal origin, for no other organism was found to account for the clinical symptoms of tonsillitis and pharyngitis. The throat infection is referred to for simplicity in the chart by the word "tonsillitis" when the infection was associated with inflamed tonsils or large tonsillar remnants, and by pharyngitis when previous tonsillectomy had been complete. When the heart has been involved in the rheumatic relapse this is termed "carditis" and where arthritis occurred without cardiac involvement this is stated briefly. A correlation between the throat infection and the subsequent secondary attacks of acute rheumatic fever is shown by the chart, and the epidemic nature of the infection is demonstrated by the succession of cases.

The organism causing the epidemic was the hæmolytic streptococcus, and it is shown that only after infection with this organism did relapses occur during these four months. A small epidemic of upper respiratory infection termed on the chart "colds" and associated with the pneumococcus produced no after-effects.

A silent period of over ten days is shown in all but two cases. In one of the latter cases (C), who had already a very much damaged heart, a very severe throat infection accompanied by a temperature of 104° lasting for four days was followed after a period of only two days by an attack of fulminating carditis. In the other no prior sore-throat was observed, nor did a throat culture five days before the relapse reveal the presence of hæmolytic streptococci. The relapse occurred, however, in the course of the epidemic, and some site of infection other than the throat was possibly responsible. Seven cases in which an almost pure growth of the organism was obtained during the throat infection had a subsequent secondary acute rheumatic attack. One similar case treated by aspirin showed no symptoms till the drug was discontinued when 35 days after the initial throat inflammation nodules appeared and the pulse-rate increased. In two cases (D and L) with slight sore-throats which were associated with the appearance of only a few colonies of hæmolytic streptococci on the plate culture from the throat no relapse occurred. Three cases (H, X, and Y) showed a few colonies on the plates at each culture, and as their throats appeared normal at the time must be regarded as casual carriers. One of the latter (H) developed clinical tonsillitis on Dec. 8th, but no culture was taken on that date and no relapse occurred subsequently. A nurse who also suffered from acute tonsillitis during this period and from whose throat a hæmolytic streptococcus was obtained, made an uninterrupted recovery.

The remaining 11 children had no infection with hæmolytic streptococci during this period, though five suffered from the "colds" already referred to, and none experienced rheumatic relapses.

POST-MORTEM EXAMINATIONS.

On the four cases which came to autopsy the macroscopic and microscopic appearances confirmed the clinical diagnosis of acute rheumatic carditis. Pericarditis was found in every case; it was associated with perisplenitis in two cases and recent endocarditis in every case. Cultures taken from the centre of the tonsils gave an almost pure growth of hæmolytic streptococci in three cases (the fourth case had had tonsillectomy). Hæmolytic streptococci were cultured in one case from an enlarged gland behind the pericardium, in another from the spleen, but in none of the four fatal cases could growth be obtained from the heart's blood post mortem.

BLOOD CULTURES.

Fifteen blood cultures were made from 11 of these patients—six during the tonsillitis, three during the silent period, and six during the acute cardiac relapse. Twelve cultures remained sterile, one was contaminated, and two grew a small diplobacillus. In no case was a hæmolytic streptococcus cultured from the blood.

The method of blood culture employed was a modification of that recommended by Cecil, Nicholls and Stainsby—e.g., 25 c.cm. of blood are withdrawn from the arm and placed in two sterile tubes, the serum subsequently removed, and 50–100 c.cm. glucose phosphate broth added. Subcultures were made every week for six weeks. This method had previously proved efficient both in routine hospital blood cultures and in cases of infective endocarditis where the organism was difficult to grow.

INTRA-CUTANEOUS TESTS.

Below are submitted some preliminary observations which have been made on the skin reactions with the products of the hæmolytic streptococci responsible for the Cheyne epidemic of tonsillitis.

Two preparations have been used. One was the exotoxin which consisted of the filtrate of a 24-hour broth culture. This filtrate was found to contain a toxin capable of producing positive skin reactions in susceptible individuals in a dilution of 1/1000. These reactions took 12–24 hours to develop and when compared side by side with Dick reactions gave similar appearances and results in nearly every case.

The second preparation, which may be termed the soluble "endotoxin," was an extract from the bodies of the cocci obtained in the following way:

The cocci were centrifuged from 100 c.cm. broth culture, washed with salt solution and heated to 60° C. for half an hour. They were *dried* in a vacuum over phosphoric pentoxide and were ground in a microbe-mill for several days, at the end of which very few intact cocci could be found in smear preparations. The ground-up bodies were then extracted with salt solution in the proportion of 10 c.cm. to the deposit from 100 c.cm. of broth culture. This suspension in turn was centrifuged until quite clear and the supernatant fluid removed and carbolised (0·5 per cent.). From this concentrated solution dilutions of 1/100 and 1/500 were made for actual use in the skin tests.

All the children in Dr. Sheldon's ward at the Cheyne Hospital were skin-tested to the exotoxin and to the soluble extract. In the chart and in Table I. are recorded the results of the tests on all the cases, except those with fulminating carditis, together with control tests on 20 non-rheumatic children from the Hospital for Sick Children, Great Ormond-street, suffering from other diseases and belonging to the same age period.

TABLE I.—*Skin Reactions with Exotoxin in Cases at the Cheyne Hospital.*

—	Cases.	Positive.	Negative.
Rheumatic cases	22	2	20
Controls	20	7	13

All cases giving positive reactions reacted to 0·2 c.cm. 1/1000 dilution and those considered negative gave no reaction to 0·2 c.cm. 1/100 dilution. It was observed that one of the cases reported above as positive became negative six weeks after an attack of acute tonsillitis associated with the hæmolytic streptococcus.

TABLE II.—*Skin Reactions with Soluble "Endotoxin" in Cases at the Cheyne Hospital.*

—	Cases.	Strongly positive.	Moderately positive.	Negative.
Rheumatic cases.	22	16	6	0
Controls	20	3	2	15

I have found it more difficult to arrive at a suitable skin test dose for the soluble extract than for the exotoxin. The cases in Table II. were tested with 0·2 c.cm. 1/100 and 0·2 c.cm 1/500 and the results read at the end of 24 and 48 hours. Reactions were considered strongly positive if they fulfilled three conditions: (*a*) the erythema at the site of an injection of 0·2 c.cm. of 1/100 dilution measured more than 20 mm. at 24 hours (read in two directions and the mean taken); (*b*) if it did not fade or if it increased in 48 hours; and (*c*) if œdema was present around the site of inoculation. In such cases the 0·2 c.cm. of 1/500 dilution gave smaller but similar readings. Reactions were considered moderately positive if, at the site of inoculation with the 1/100 solution there was an erythema of 12 mm. or more with slight œdema which persisted for 48 hours.

In many of the rheumatic cases the reactions were severe, an erythema appearing of more than 40 mm. This was accompanied by œdema and followed by the formation of a central necrotic area which resembled in appearance a strong Mantoux reaction. In one case the erythema round the site of inoculation with the weaker solution resembled that of erythema marginatum.

Some observations were also made on ten cases skin-tested during acute fulminating carditis. In these very sick children a greatly reduced sensitiveness to the "endotoxin" was observed during the most acute phase of the relapse. Some of these cases, observed throughout their illness, were shown to be positive both before and after the acute relapse. This phenomenon is probably merely a temporary inability of the body cells to react; a similar loss of skin sensitiveness is often observed in fulminating tuberculosis and typhoid fever and has been described by Mackenzie and Hanger[9] and others.

These skin tests show that there is a marked difference between the toxic action of the exotoxin and that of the endotoxin; while the exotoxin gave fewer reactions in the rheumatic cases than in the normals, the soluble endotoxin reacted in 100 per cent. of rheumatics and in only a quarter of the controls. It must be remembered that this group of rheumatic children were all cases who had suffered from previous attacks of acute rheumatism associated with carditis and had probably had previous streptococcal infection.

A number of experiments were performed to ascertain as far as possible some of the properties of these two streptococcal products. Some cases which had previously been proved to give positive reactions to the exotoxin or to the soluble endotoxin were retested with solutions of these substances which had been placed in a boiling water bath for one hour. The exotoxin was found to be inactivated by the heat while the reaction to the endotoxin was unaltered.

Neutralisation experiments with the serum from persons giving negative skin reactions showed that the exotoxin was completely neutralisable while the endotoxin tended to give conflicting results with similar experiments. It seemed, however, clear that the degree of skin sensitivity to the latter did not depend on a simple toxin-antitoxin balance, but on a sensitivity of the cells themselves. The above results show that the exotoxin is neutralisable and heat-labile and probably identical with the Dick toxin, while the endotoxin is heat-stable and probably unneutralisable by serum.

Some further preliminary experiments were done with a view to finding the chemical compositions of the active principle in the soluble endotoxin:—

(*a*) 5 c.cm. of the original saline extract were dialysed for over 100 hours till the dialysate no longer contained any trace of salt when tested with a few drops of silver nitrate. At the end of the experiment the amount of the fluid in the sac was found doubled and a precipitate had formed at the bottom. The precipitate was redissolved, and both it and the supernatant fluid from the dialysis were made up to dilutions calculated as 1/100 of the original extract. Both gave strongly positive skin reactions on known sensitive cases, though the supernatant fluid appeared to be the more potent.

(*b*) 5 c.cm. of extract were precipitated with decinormal acetic acid at a pH 4. (Both supernatant fluid and redissolved precipitate gave positive reactions and again the former was the more potent.)

(*c*) 5 c.cm. of extract were saturated with ammonium sulphate; tests showed that both deposit and supernatant fluid contained the active principle.

These experiments demonstrate that the active principle of the endotoxin is not dialysable. The fact that it was present in both supernatant fluids and precipitates suggests that it is a very soluble substance which probably adheres to the precipitates and is carried down with them.

Swift, Wilson, and Todd[10] have demonstrated marked hypersensitiveness of rheumatic fever patients to "nucleo-proteins" prepared from all types of streptococci but most marked to those from hæmolytic types. Coburn,[4] to whom further reference is made below, has also shown supersensitiveness in 00 per cent. rheumatic fever patients, to "nucleo-proteins" obtained from the hæmolytic streptococcus but not to those from a *viridans* strain. There are many references in the literature of the last five years to skin tests on rheumatic cases to filtrates and autolysates prepared from any different types of non-hæmolytic streptococci, by Birkhaug[11] and others.

However, the number of cases reported in this paper is not sufficiently numerous to warrant a comparative discussion of these works at present. A further study with purified extracts from other strains of hæmolytic streptococci and from non-hæmolytic streptococci is at present being undertaken and will be reported in another communication.

Discussion.

In Coburn's[4] work referred to above there is presented a most formidable array of facts in support of his view that the hæmolytic streptococcus and no other organism, culturable by ordinary means, causes the upper respiratory infections associated with acute rheumatism. He brings forward evidence to show that—

> *hæmolytic streptococci are but rarely found in the tropics* where acute rheumatism is almost unknown. In a group of children whom he transported to Porto Rico from New York all symptoms of active rheumatism disappeared in a short time along with the coincident disappearance of the hæmolytic streptococcus from their throats. On subsequent return to New York hæmolytic streptococci appeared once more and their appearance was followed by rheumatic relapses.
>
> The throat flora of a group of ambulatory rheumatic children were kept under observation for over a year and the effect of upper respiratory infections watched. Although epidemics of nasopharyngeal infection occurred with the pneumococcus, Pfeiffer's bacillus, the hæmolytic staphylococcus, and the hæmolytic streptococcus, it was only after infection with the latter that rheumatic relapses tended to recur. He also observed a very high degree of sensitiveness in rheumatic cases to "nucleo-protein" prepared from the hæmolytic streptococcus.

The facts presented in this paper were obtained by the study of an epidemic of rheumatic fever following the recognition of the silent period and offer a different approach to the subject than that pursued by the last author, yet the results are in remarkable agreement with his findings. They deal only with rheumatic relapses in association with acute hæmolytic streptococcal infection of the throat. However, these relapses, studied from the clinical point of view, show all the symptoms of second acute attacks of rheumatic fever rather than the mere lighting up of a subacute focus; they would be better described as acute secondary attacks of rheumatic fever, since in every instance where relapse occurred the disease was inactive at the time of the acute nasopharyngeal infection.

So far as present knowledge goes there does not appear to be any essential distinction between primary and secondary attacks of acute rheumatic fever. Scarlatina may, for example, give rise to an attack of acute rheumatic fever in cases with no previous history of rheumatism and it commonly causes a relapse in children with a rheumatic history. In both cases the phenomenon of the silent period is similar—i.e., a period of 10–20 days elapses between the onset of infection and the appearance of the rheumatic symptoms.

In spite of the difficulty of getting a clear history of sore-throat and obtaining satisfactory throat cultures in many cases arriving at hospital with primary attacks of rheumatic fever such cases as the following are not infrequently met with in the wards of the Hospital for Sick Children, Great Ormond-street:—

Boy, aged 7 years, admitted to Dr. Hutchison's ward complaining of pain in the chest and shortness of breath.

Past history: Frequent attacks of acute tonsillitis.

History of present illness: Four weeks ago had acute tonsillitis associated with fever; 14 days later pains commenced in muscles and joints, later increasing in intensity and being associated with general malaise. Shortness of breath developed gradually from this date.

Physical examination on admission: This revealed acute pericarditis, the tonsils were large and red and showed signs of recent acute inflammation. On admission throat culture gave a still predominant growth of hæmolytic streptococci. Five weeks later the throat infection appeared to have cleared up and hæmolytic streptococci could no longer be demonstrated by throat culture. The tonsils were enucleated five and a half weeks after admission. They were large but not unhealthy and contained no pus; cultures made by direct smear on blood-agar plates from the centre of the tonsil grew only two colonies of hæmolytic streptococci. Skin tests with hæmolytic streptococcal "endotoxin" gave strongly positive reactions.

I wish to thank Dr. Hutchison for allowing me to publish this case.

This case demonstrates how the infection soon disappears from the throat in rheumatic fever and is an example of acute hæmolytic streptococcal tonsillitis followed, after a silent period of 14 days, by the appearance of symptoms of acute *primary* rheumatic fever; it affords additional evidence in support of the view that the essential mechanism is the same in primary and secondary attacks.

The case quoted above also brings out another point of considerable importance. The clinical notes give a history of repeated attacks of acute tonsillitis. This is a very constant finding in the histories of cases of acute rheumatism. Often a history of previous scarlet fever is also obtained. This fact suggests the possibility of an altered body reaction being produced in persons who have had previous streptococcal infections. Clinically an early rheumatic state has been described. While no very clear picture of this state can be given, every children's physician constantly sees children complaining of vague limb and joint pains or slight choreic movements.

It is in this connexion that the discovery of a soluble extract from the body of the hæmolytic streptococcus to which rheumatic cases are particularly sensitive is of interest. The skin sensitiveness is such that the inoculation of 0·2 c.cm. of a dilution of 1/500 of the extract will cause an erythema of 35 mm. an inner area of œdema of 20 mm. and a central area of necrosis of 7 mm. in a hypersensitive rheumatic case, while 0·2 c.cm. of 1/100 extract injected into a non-rheumatic insensitive case will produce no reaction at all. This is indeed a very profound change in tissue reaction.

But it must be clear to anyone who has studied the clinical phenomena of the acute rheumatic state characterised by such different manifestations as arthritis, rheumatic nodules, carditis, chorea, and skin eruptions, that the dissemination of a soluble poison from a single focus of infection can hardly be the sole factor in the production of all these conditions.

The fact that 15 blood cultures during life and four cultures from the heart's blood at autopsy, reported on in this paper, did not reveal the presence of the hæmolytic streptococcus in any case would suggest that this organism had not at any time produced a *septicæmia.* The discovery, however, of the hæmolytic streptococci in foci so far distant as the spleen and the pericardial glands does indicate at least a transient bacteræmia with the organism causing the upper respiratory infection.

The observations recorded in this paper show: (1) that an acute infection of the throat with hæmolytic streptococci may cause secondary attacks of acute rheumatic fever in children who have already suffered from one or more attacks of acute rheumatism; and (2) that such children are highly sensitive to intracutaneous injection of a soluble extract of the bodies of the hæmolytic streptococci. The precise bearing of these findings on the pathogenesis of rheumatic fever requires further investigation, and there are many questions upon which information must be sought before the part played by the hæmolytic streptococcus can be defined.

Summary.

1. An epidemic of tonsillitis in a ward occupied by cases of rheumatic heart disease at the Cheyne Hospital for Children was shown to be caused by the hæmolytic streptococcus. 2. Rheumatic relapses occurred in 9 out of 11 children who developed acute streptococcal infection, while similar febrile disorders not associated with the hæmolytic streptococcus caused no relapse. 3. In addition to the throat cultures 15 blood cultures taken in 11 cases during life and four cultures from the heart's blood after death failed to reveal the presence of the hæmolytic streptococcus in any case, though the organism was cultured at autopsy from the centre of the tonsils in three cases, the spleen in one, and the glands draining the pericardium in another. 4. Intracutaneous tests were made with the exotoxin and a soluble "endotoxin" from the hæmolytic streptococcus causing the outbreak. 5. Rheumatic subjects were found to be very sensitive to the endotoxin while they gave fewer positive reactions to the exotoxin than a similar age-group of controls. 6. The association of throat infection with hæmolytic streptococci and rheumatic fever is discussed and a possible causal relationship suggested.

This paper was written in conjunction with Dr. W. Sheldon, without whose help and the splendid coöperation of the sister of the ward at the Cheyne Hospital the work could never have been done. I wish particularly to thank Dr. F. Griffith for his help and advice throughout the whole of the work. Many of the extracts were prepared in the pathological laboratory of the Ministry of Health. I should like to thank Dr. J. A. Glover for his advice and Dr. W. W. Payne and Mr. P. Bruce White for their help in connexion with the chemical analysis of the extracts. The work was done in the Research Department of the Hospital for Sick Children, Great Ormond-street, under the direction of Dr. D. Nabarro, to whom and to the medical staff of the hospital my sincerest thanks are due.

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PERMANENT SEPARATION OF THE EPIPHYSIS FOR THE CAPITELLUM.*

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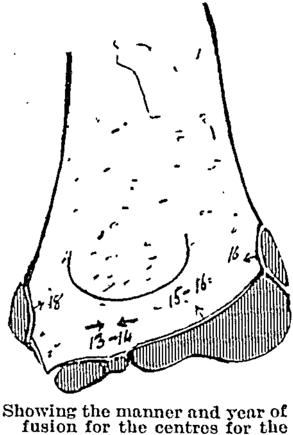
THE manner of ossification of the lower end of the humerus is variously described in papers and text-books. This is because the centres appear at varying ages, not always at one particular date. I have taken the earliest age at which any centre has been noticed as present and adopted it as the basis of the following description. I do not assert that this is the age at which the centre appears, but it is the age before which it is not found. All writers agree as to the order of appearance of the centres: capitellum, internal epicondyle, trochlea, and, if present, external epicondyle. The last-named is surgically of no importance. Most writers agree also as to the order in which these centres fuse with each other and with the shaft, but disagree by as much as three years on the age at which these fusions take place.

The earliest age at which these centres have been found is: capitellum, 1 year; internal epicondyle, 3 years 9 months; trochlea, 8 years; external epicondyle, 9 years. The last three may not appear until two or three years later than the age indicated, but the centre for the capitellum is almost always present at 1½ years. The centres for the capitellum and trochlea (that for the latter consisting of two nuclei placed side by side) (Fig. 1) unite in the thirteenth or fourteenth year and join the shaft in the fifteenth or sixteenth year; the two remaining centres join up a little later, the outer fusing equally with the capitellum and the shaft, the inner joining the shaft separately at a higher level, last of all. At 19 years it is unusual to find any epiphyseal lines showing.

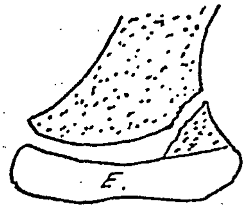
FIG. 1.



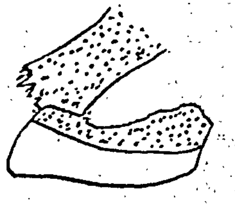
Showing the manner and year of fusion for the centres for the lower end of the humerus. The curved line indicates the position of the olecranon fossa, through which transverse fractures take place.

At birth the lower end of the humerus consists entirely of a cap of cartilage, and it is possible, though extremely rare, for this to be torn completely away from the shaft. There is a specimen very nearly showing this in the Museum of the Royal College of Surgeons (Fig. 2) and Mouchet[1] has described a case. On the other hand, the inner end of this cap, containing the centre for the internal epicondyle, is frequently torn off. In out-patient work this is the condition known as "injury to the lower epiphysis," and usually nothing is done for it. It should be replaced by open operation. When the child is a few years old, it is not at all unlikely to sustain a transverse fracture through the olecranon fossa, often with gross displacement of the fragments (Fig. 3). Though this is a break in the bone and the line of cleavage is some distance away from any epiphyseal line (see also Fig. 1), it has in the past been described as a separation of the lower epiphysis. The true separation which does occur is a tearing away from the cap of cartilage of practically its outer half, containing the centre of ossification for the capitellum. This centre is D-shaped and can be seen displaced in the lateral radiogram; normally the plane of its axis as mentioned by Cohn[2] should intersect that of the shaft at an angle of 60° (Fig. 4). The part displaced is much larger than the part seen in the radiogram, for the D-shaped part is only the bony nucleus or kernel. It is also much more than the part destined to be the capitellum, for it extends inwards to include half the trochlea (Fig. 1). In the two following cases this accident occurred in early life, and the torn off part has remained as a separate bone.

FIGS. 2 3



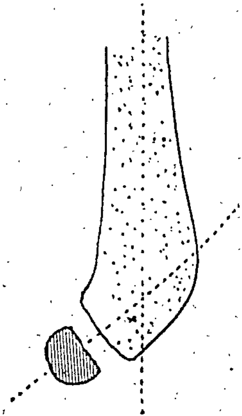
Child, aged 2. Separation of epiphyseal cartilage (E) of humerus.



Child, aged 2. Transverse fracture through olecranon fossa, formerly described as a separation of epiphyseal cartilage.

Both these drawings are from specimens in the Museum of the Royal College of Surgeons, numbered respectively 3579.1 and 3396.1.

FIG. 4.



The D-shaped bony centre or epiphysis for the capitellum, as seen in a lateral radiogram. The plane of its axis should intersect that of the shaft at an angle of 60°.

CASE 1.—A jar washer, aged 22, was sent to me on May 3rd, 1928, by Dr. R. H. Evans, complaining of pain in the left shoulder, which she had had on and off for years. On examination she was found to have a marked deformity of the left elbow; there was cubitus valgus, the "carrying angle" being 135° instead of the normal 105°. She said she had broken the left elbow when 4 years old, and that it had been crooked ever since. The radiogram showed that the outer half of the lower end of the humerus was lying separate from the rest of the bone (Fig. 5). Though separate, it has retained fairly well its correct shape and the radius articulates normally with it. There is a considerable gap, however, between it and what is left of the trochlea. The radius and ulna form a very oblique angle with the humerus.

The function of the elbow is perfect, except that its shape renders some movements very awkward. I suggest that the pain in the shoulder may be due to commencing osteo-arthritis, caused by abnormal strain because of the awkward elbow. As pointed out by Lane and others, when one joint of a limb is thrown out of line, the other joints eventually become affected.

CASE 2.—A hand driller in the Royal Arsenal, aged 18, was sent to me on August 9th, 1928, by Dr. C. Kingsley Carroll, complaining of pain in his left elbow when carrying heavy weights. On examination I found a similar deformity of the left elbow, with a similar "carrying angle"; and there was a history that when 6 years old he had dislocated it and had the dislocation reduced. The radiogram (Fig. 6) showed a distorted elbow, with complete separation of the capitellum from the humerus. There is a large gap between it and the latter bone and between it and the radius; again part of the trochlea is missing, and again the radius and ulna form a very oblique angle with the humerus. The capitellum has been twisted through 90°, its radial surface pointing directly outwards instead of downwards. The radial head has tried to reach the capitellum, as shown by its very marked hypertrophy. Though there is full movement of the elbow, the articulation of the head of the radius is peculiar; for the capitellum is movable, and when the radius rotates the former rotates with it, so that part at least of the movement takes place between the capitellum and the humerus. There must be a fibrous band joining the capitellum to the radius.

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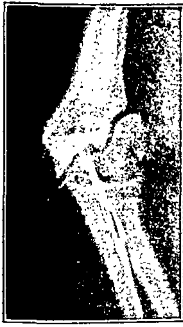
* Based on a paper read before a meeting of the British Orthopædic Association held in London on Nov. 29th, 1930.

[1] Mouchet, Albert: Presse Méd., Nov. 10th, 1928.

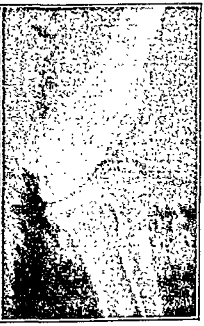
[2] Cohn, I.: Arch. of Surg., 1921, ii., 455.

FIGS. 5



Permanent separation of the epiphysis for the capitellum, without displacement.

6



Permanent separation of the epiphysis for the capitellum, with rotation through 90°.

These cases are presented as examples of true separation of the centre for the capitellum, and differ from the Royal College of Surgeons' case and from Mouchet's case, in both of which the whole cartilaginous cap was involved. They demonstrate the result of non-operative treatment. In the second patient, the rotation through 90° and the wide displacement account for the non-union, but in the first, where the separated portion appears to be accurately opposed and in proper line, one must suppose that the gap is due to the intervention of tags of torn muscle or capsule.

The correct treatment of this injury, if met with directly after the accident, is open operation and replacement of the separated fragment by suture. I propose to do a transverse osteotomy of the humerus in the first case, and to replace the fragment in the second. In the first I attribute the pain to secondary osteo-arthritis of the shoulder-joint; when the humerus is put straight the pain will go. If I am wrong, the patient will be no worse off, and will have a straight arm. In the second, the pain is due to the insecure arrangement of the radio-humeral articulation, and this must be put right. If the patient wishes, an osteotomy can be done later.

After reading my paper, I had a letter from Mr. G. H. Stevenson, of Glasgow, enclosing notes of a case similar to Case 1. The radiogram, except that it is of the right arm instead of the left, is identical with that of my patient. His case concerned a woman aged 40, complaining of severe pain in right arm, with wasting of all the ulnar intrinsics. There was marked "cubitus valgus," and she gave a history of a fall on the right elbow when a child. He operated and transposed the ulnar nerve to the front of the elbow, *with excellent result*. This case suggests the possibility of both of my cases developing nerve symptoms in later years.

THE ZONDEK-ASCHHEIM REACTION.

BY WILLIAM STEWART, M.D. GLASG.,
ASSISTANT PATHOLOGIST TO THE ROYAL HOSPITAL, WOLVERHAMPTON.

WITH the introduction of the Zondek-Aschheim reaction all other biochemical tests for the diagnosis of early pregnancy were superseded. As workers over a wide area were obtaining excellent results it certainly seemed worthy of investigation; some of the results of 12 months' study here are given below. The method employed was a slight modification of that introduced by H. Allan and F. Dickens.[1] The mice received the injection over a period of three days, morning and evening of each day; it is not essential to keep to the exact time each day. They were killed on the morning of the fifth day.

Results.

Group A.—Physiological Pregnancies.

Normal uncomplicated pregnancies	18
Hyperemesis	4
Pregnancy and heart disease	1
Pregnancy, pyelitis, and albuminuria	6
Pregnancy and epilepsy	2
Pregnancy and syphilis	2
Pregnancy and gonorrhœa	1
Pregnancy and pulmonary tuberculosis	2
Pregnancy and excessive obesity	2
Pregnancy and uterine fibroids	2

All gave a positive reaction.

Group B.—Abnormalities of Pregnancy.

	Cases.	Pos.	Neg.
Hydatidiform mole	9	8	1
Carneous mole	2	2	0
Dead fœtus	1	1	0
Ectopic pregnancy	3	2	1

Group C.

	Cases.	Pos.	Neg.
Amenorrhœa	9	0	9
Menstruation	1	0	1
Menopause	2	0	2
Rape	1	0	1
Abortion	3	0	3
Abnormalities of thyroid	4	1	3

Group D.

	Cases.	Pos.	Neg.
Tabes dorsalis	1	0	1
Amenorrhœa and gonorrhœa	1	0	1
Fibroids and fibrosis uteri	4	0	4
Uterine polyp	1	0	1
Menorrhagia	2	0	2
Salpingitis	1	0	1
Carcinoma of cervix	3	0	3
Carcinoma of body of uterus	1	0	1
Ovarian tumours	9	0	9
Pituitary tumours	1	0	1
Unclassified	3	0	3

Duration of Pregnancy in the Cases Cited.

(Days numbered from last menstrual period.)

25 to 60 days' amenorrhœa	14 cases.
60 to 100 " "	10 "
100 to 200 " "	4 "
200 days to full time	11 "

The only fallacy was a case of hyperthyroidism in a female aged 19, both lobes of the thyroid being enlarged, the basal metabolic rate being plus 43, and menstruation regular. The specimen of urine was obtained two days before menstruation was due and gave a positive reaction. This was followed two days later by normal menstruation. In such cases hypertrophy of the anterior pituitary gland has been noticed. In the case of hydatidiform mole which gave a negative reaction, the specimen of urine was obtained five days after parturition; this might explain the negative reaction.

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[1] THE LANCET, 1930, i., 39.

A case of dead fœtus.—There had been amenorrhœa of 233 days, before which menstruation had been regular. The reaction was done because, on physical examination, the clinical findings did not agree with the patient's history, but suggested a pregnancy of three months. The patient herself thought there was something wrong; it was a second pregnancy. Twenty-seven days after a positive result had been sent a macerated fœtus was evacuated. The estimated age of the fœtus was 2–3 months.

Cases of ruptured ectopic gestation.—Case 83 was a patient admitted as a case of acute appendicitis; no menstrual period had been missed, and previously menstruation had been regular. The condition proved to be a tubal abortion. The reaction obtained was negative.

In Case 116, 32 days had elapsed since the last menstrual period. The time of rupture as judged by the onset of pain and abdominal symptoms preceded the specimen of urine obtained by 31 hours. This case gave a positive reaction.

Case 123 had had 58 days' amenorrhœa; at operation a large quantity of clotted blood was found in the pelvis with the remains of the fœtal tissues. The urine gave a positive reaction.

SUMMARY OF RESULTS.

	Cases.	Pos.	Neg.
Group A	30	30	0
„ B	15	13	2
„ C	23	1	22
„ D	24	0	24

TRANSITION FROM NEGATIVE TO POSITIVE.

Three cases illustrated the transition from the negative to the positive reaction during pregnancy.

CASE 1, a school-teacher by profession, had obtained a post at some distance from her home. She was extremely anxious to have a child, but there had been two miscarriages in the past. She was athletic, and the abortions had been attributed to this. She visited her doctor to see if he thought she might be pregnant; if so, she was willing to give up her intended post in the hope that her pregnancy might terminate successfully. Her menstruation was of the 28-day type, and was not due until five days after the visit to her medical adviser. There had been no interruption of menstruation. The urine was obtained on the Tuesday, Wednesday, and Thursday, menstruation being due on the following Friday. This specimen of urine gave a positive œstrin reaction only. The menstrual period was missed. Another specimen of urine was obtained on the Tuesday, Wednesday, and Thursday of the following week. This specimen gave a positive reaction. She gave up her intended post and I assisted at the circumcision of the offspring in the early part of this year.

CASE 2, an unmarried girl, had had her last menstrual period on August 14th, 1930. Coitus, which only occurred once, took place on Sept. 1st. The menstrual period due in the middle of September was missed. The urine was examined on Sept. 22nd and gave a positive œstrin reaction only. A second specimen was obtained from that passed on the morning of Oct. 1st, and this specimen gave a positive reaction.

CASE 3, a patient admitted as a case of acute appendicitis, had not missed a period, and previously menstruation had been regular. A specimen of urine was obtained before the patient was sent into the theatre. Laparotomy showed a tubal abortion. The reaction was negative.

These cases show a definite negative reaction at the commencement of pregnancy. The transition occurred in the first case between the twenty-first and twenty-eighth day of pregnancy, and in the second case between the twenty-second and thirtieth day of pregnancy.

THE REACTION IN THE PUERPERIUM.

How long does the reaction remain in the puerperium? One case gave the following result:—

10 hours after labour	result positive.
20 hours after labour.. ..	„ „
34 hours after	œstrin reaction only.
44 hours	reaction negative.
60 hours	„ „

OTHER CASES.

Normal pregnancy	51 hours after labour..	reaction negative.
	77 „ „ „ ..	„ „
Carneous mole	3 days after	„ „
Hydatidiform mole	36 hours after	„ positive.
	3 days after	„ negative.
Hydatidiform mole and pulmonary tuberculosis 18 days after		.. reaction negative.

DEATH OF THE MICE DURING THE TEST.

This has been a considerable factor in the work of others; some have had to abandon the test altogether. This has not been my experience. It has been overcome by the following methods: (1) using the blood-serum; (2) centrifugalising the urine; (3) treating the urine with ether.

Where the urinary tract is infected, this difficulty may be overcome by using the blood-serum. It can be used in doses of 0·1 c.cm. at each injection. The urine may be centrifuged and the supernatant fluid only used. Treatment of the urine with ether has been found most satisfactory. In no specimen of urine received has the result been vitiated by reason of the toxicity of the urine. The method used is as follows. The urine is shaken up with a small quantity of ether and allowed to stand. As the ether is of lower specific gravity than the urine it rises to the surface, and is allowed to evaporate. Evaporation may be hastened by incubation at 37° C. in an evaporating dish. Nothing is extracted from the urine, and a sterile urine is left behind. I have successfully used this method where the urine had been kept over an interval of 23 and 47 days. Further observations have shown that where acetone is not present in the urine the separation may be hastened by using a separating funnel. If acetone be present and the separating funnel be used, some at least of the active principle is extracted. It is apparently immaterial whether the acetone is already present, as in hyperemesis, or is added.

Various other methods have been tried, among them the Zeitz filter, which removed not only the organisms but also the active principle. The other treatment is useful for specimens sent by post.

Discussion.

This was an entirely impartial investigation into the Zondek-Aschheim reaction, and the results obtained show it to be a definite and reliable one. The urine from cases in which the products of conception are present contains an active principle which acts as a specific stimulus to the ovary of the immature mouse. There is apparently a definite negative reaction at the commencement of pregnancy and the chorionic villi are developing about the time that the reaction becomes positive. It is probably from these that the stimulus comes for the over-production of the anterior pituitary hormone. Chorionic tissue is the only tissue that is common to all the above conditions. Death of the fœtus has apparently no effect on the reaction. So long as there is living chorionic tissue present a positive reaction is to be expected. It is immaterial whether this chorionic tissue is physiological or pathological. Macroscopic examination of the ovaries is sufficient; in no case has this finding been reversed by section of the ovaries.

SUMMARY.

1. This reaction is a reliable test for pregnancy. 2. The only fallacy in this investigation was in a case of Graves's disease. 3. The mortality in the mice can be overcome by treatment of the urine with ether. 4. Ether in the absence of acetone does not extract the active principle, but if acetone be present the active principle is extracted. 5. The reaction becomes positive at about the twenty-fifth day after conception. 6. The reaction disappears from the urine about 30 hours after parturition.

This work has been carried out in the pathological laboratory of the Royal Hospital, Wolverhampton. I am much indebted to Dr. S. C. Dyke, director of the department, for originally suggesting this subject, and for the admirable facilities which he has afforded me; also to the governors of the Royal Hospital. I am also much indebted to the coöperation of my medical colleagues, Mr. S. W. Maslen Jones and Dr. N. Wilkes, of the Women's Hospital, Wolverhampton; to Dr. G. Mitchell, director of the venereal diseases department, the Royal Hospital, Wolverhampton; to Dr. S. J. Cameron, consulting physician; and to Dr. D. M. Hart and Dr. M. Gilchrist, of the resident staff of Royal Maternity and Women's Hospital, Glasgow; to Prof. Beckwith Whitehouse and Dr. A. P. Thomson, of Birmingham; and to Mr. R. Stanley Lee, medical superintendent of the Municipal Hospital, New Cross, Wolverhampton.

CLINICAL AND LABORATORY NOTES

GONOCOCCAL POLYARTHRITIS IN A NEW-BORN CHILD.

BY A. D. C. BELL, B.M. OXF.,
MEDICAL REGISTRAR AND TUTOR, CHILDREN'S DEPARTMENT, ST. THOMAS'S HOSPITAL;

AND

P. A. CLEMENTS, M.B. DURH.,
SENIOR MEDICAL OFFICER, VENEREAL DISEASES DEPARTMENT, ST. THOMAS'S HOSPITAL.

THE case here reported is that of a female infant born at term after a normal labour and weighing at birth 8 lb. 8 oz. The mother, aged 38, had had five other children all of whom were said to be alive and well. As a result of the infant's developing an acute ophthalmia in the right eye the mother was examined and found to have gonorrhœa, gonococci being found in cervical and urethral smears. The blood, examined by Dr. T. E. Osmond, gave a positive reaction to the gonococcal complement-fixation test, but a negative to the Wassermann.

The infant, born on Oct. 4th, 1930, was reported to have been quite normal until the fourth day when, as noted above, a purulent ophthalmia was discovered, and on the eighth day it was noted that she had swelling of the middle joints of the left forefinger and the right third finger, which was followed on the next day by a similar condition of the metatarso-phalangeal joint of the right great toe and of the ankle.

She came under our care when 16 days old. The general nutrition was fair and she was apparently free from pain except on movement of the affected joints. The temperature was 101° F. The joints above mentioned were swollen and the skin over them hot, red, and shining. No active inflammation of the conjunctiva was present and there was no discharge. On aspiration of the affected joint of the left forefinger, flaky pus was withdrawn containing numerous gonococci, which were demonstrated both in smears of the fluid and in culture on hydrocele agar. Prolonged search on numerous occasions failed to reveal any active focus until the eighth day after admission, when a scanty purulent discharge was noted in the right eye, and in this were numerous extracellular gonococci. A slight vaginal discharge was noted two days after admission, but no gonococci were found in it, and it disappeared in a few days under irrigation with a weak solution of chloramine-T.

The mild conjunctivitis was treated with boric acid irrigation every four hours, and daily painting of the everted lids with 2 per cent. solution of $AgNO_3$, followed by ung. hydrarg. oxid. flav. applied to the lids. After ten days' treatment gonococci still persisted in the slight conjunctival discharge, and instillations with 5 per cent. protargol were substituted for the silver nitrate, but gonococci continued to be found for another four days. The joints were treated by protection from the weight of the bedclothes, no splints being applied, and gradually improved until, on the twenty-seventh day after admission, only a little peri-articular thickening of the ankle and the middle-joint of the third finger of the left hand remained; five days later radiography showed no articular changes. The complement-fixation reaction carried out by Dr. J. Oliver was negative on admission and a month later. The patient was discharged practically recovered five weeks after admission, and when seen 11 weeks later was in good condition, gaining weight normally, and showing no sign of disease.

Gonococcal arthritis in infants appears to be a rare condition, for we have discovered reports on only 43 cases, and in many of these the causative organism was not identified. The arthritis in this case was apparently secondary to a gonococcal conjunctivitis which subsided as the arthritis developed, and relapsed as this improved. The reappearance of gonococci in the conjunctival sac and their persistence after relapse, though this was accompanied by only slight signs of irritation, is of interest, as is also the fact that the gonococcal complement-fixation reaction remained negative in the presence of a well-marked gonococcal arthritis, such as in an adult would almost certainly have given rise to a positive reaction. That the mother's infection was discovered only by the fact of the child developing ophthalmia shows the importance of careful ante-partum examination.

For permission to publish this case we are indebted to Colonel L. W. Harrison.

A CASE OF PAROTID CALCULUS.

BY D. M. SUTHERLAND, M.D. MANCH., F.R.C.S. ENG.,
HON. ASSISTANT SURGEON TO THE ROYAL MANCHESTER CHILDREN'S HOSPITAL; HON. SURGEON TO STOCKPORT INFIRMARY.

IN April of this year a woman, aged 48, presented herself with a diffuse swelling of the left parotid gland. She stated that about 10 years previously she began to experience a feeling of fullness in the gland with swelling which appeared at meal-times and subsided about half an hour after a meal. The swelling did not appear each day and after five months the trouble disappeared. Eight years later the condition recurred and she noticed that pus was exuding from the inner side of the cheek. The swelling of the gland persisted and she began to suffer severe dyspeptic symptoms. She developed symptoms of hyperthyroidism, the toxic symptoms of which she still displayed at the time of operation. On examination the entire parotid gland was enlarged and the anterior portion showed a softened area with a hard centre suggestive of the presence of calculus. Radiography however gave a negative result.

The history of the case seemed to point so definitely to the presence of calculus that it was decided to explore the gland. The hardest and most prominent portion of the gland was explored by a needle and a calculus was felt. A horizontal incision was made into the gland directly over the prominence, a small abscess cavity opened, and a calculus about ¼ in. in length and ⅙ in. in thickness removed. Within 48 hours of the removal of the calculus the discharge of pus into the mouth had ceased. Although the wound was slightly inflamed for several days a fistula did not ensue. The general enlargement of the gland has subsided gradually but the immediate relief of the dyspepsia was remarkable. There was no sign of injury to the facial nerve.

The stone proved to be only slightly opaque to X rays. It did not show the presence of any foreign body.

There has been much discussion concerning the ætiology of calculus formation in the salivary glands. It has been suggested that the cause may be the entrance of a foreign body into the duct of a gland or that it may be infection of the gland with bacterial decomposition of the secretion and precipitation of its colloid and inorganic constituents. In the case reported neither of these two factors appeared to be the cause. The calculus was in the gland and not in the duct as would have been expected if a foreign body had been the cause. The parotid duct runs forwards from the gland upon the masseter muscle to its anterior edge where it turns sharply inwards through the cheek piercing the buccinator muscle, and then runs forwards between this muscle and the mucous membrane; it opens into the mouth by a minute orifice. From anatomical considerations it would appear difficult for calculus in the gland to be due to a foreign body. The fact that the parotitis and abscess formation disappeared after the removal of the calculus suggested that the infection was secondary and not the cause of the calculus.

It must be remembered also that bacterial infection of the parotid gland is much more common than that of any other salivary gland and yet calculus formation is rare. The above case suggests that the calculus was due to the precipitation of the constituents of the parotid secretion caused by some unknown alterations in the reaction of the gland. Two other points brought out by the case are the value of probing the gland by means of a fine needle, which does no harm, and the fact that a negative radiographic examination does not disprove the existence of a stone.

REVIEWS AND NOTICES OF BOOKS

Florence Nightingale, 1820–1856.

By I. B. O'MALLEY. London: Thornton Butterworth, Ltd. 1931. With 24 illustrations. Pp. 416. 21s.

Florence Nightingale, a national heroine, is already the subject of a complete biography by Sir Edward Cook, while estimates of her character and summaries of her life-work have won places in much general literature. But Mrs. O'Malley's book is none the less wanted, for it enables us to appreciate the intimate motives of Florence Nightingale's conduct, her hesitations and doubts and their origins, the interplay upon her feelings and her actions of her home environment and the influences of her few but intimate affections. The author's attempt has been to give a representation of things that might have been—indeed certainly would have been—in an autobiography, and then to depict Florence Nightingale's early years to the reader, as they might have appeared to Florence herself. In a generous preface, Mrs. O'Malley urges that all should read Sir Edward Cook's book, or, at any rate, the abridged version of this book which appeared in revised form in 1925, written by Mrs. Vaughan Nash, but she makes no attempt to compete with either work.

The record leaves off at the end of the Crimean war, when Florence Nightingale was 36 years old. It is divided into two equal parts, the first dealing with the early life and the second with the Crimean war, and in each case, wherever possible, Florence Nightingale is made to speak for herself and to observe and record her own experiences. This has been possible because a large number of personal notes, journals, and letters, written by Florence Nightingale, and now in the hands of the Nightingale family, were entrusted to Mrs. O'Malley for the purposes of her undertaking, and she has made excellent use of this material. The first part consequently is very detailed—too much so, it may seem. But as we proceed we are able to see that the story as told, whether the episodes are pathetic or amusing and whether they bring associations with a great world or with the peasants of a small community, does more than make good reading. It forms an astonishingly accurate introduction to what happened in 1854–56, when a cultured young woman, self-trained (and that only partially), and surrounded by every barrier of social restriction, left the drawing-room and the park for the battlefield and the sick ward to strive against revolting realities, supported by little but high dreams of duty. From the very beginning we seem to see that Florence Nightingale was fulfilling a destiny. At the age of 9 she began to write her life—La Vie de Florence Rossignol—when already she "desired to be useful to sick persons," and family letters to which Mrs. O'Malley has had access, especially letters to her cousin and friend Hilary Bonham Carter, show that always this urge to devote herself to the solace of suffering was with her. When Florence Nightingale was 17 years of age the Nightingale family went abroad, and for the next two years she kept a journal, from which it is clear that she became generously fired with the cause of a united Italy, and developed more interest in social questions than in the splendid displays of art. The Nightingales were wealthy and the continental tour was intended as a prelude to the entry of Florence and her elder sister into fashionable life. But the intention failed as far as Florence was concerned. On return to England, Mrs. Nightingale's own social ambitions, which were acute, were gratified, but by this time Florence had arrived at the conclusion that "the only way to make life real is to do something to relieve human misery." She refused a brilliant offer of marriage; further trouble in Greece and Egypt did nothing to reconcile her to society; a visit to a German orphanage confirmed her intention to be a nurse, and at last, just a year before the outbreak of the Crimean war, she got definitely free from the shackles of home life, obtaining a post as superintendent of a nursing home.

From this point Mrs. O'Malley tells the story of Florence Nightingale's experiences in the Crimea relying for the facts upon public documents, but throwing searching light upon them all by the use of Florence Nightingale's correspondence, and that of a few friends who accompanied her to the seat of war. The various adventures—for much of the hospital work in the Crimea was a series of adventures—are told very simply in those side-lights on history; there is not the slightest attempt to magnify horrors, and full play is given wherever possible to the lighter side of things, the author following here Florence Nightingale's own method of narrative. And throughout all the second part of the book the feeling grows that Florence Nightingale was fulfilling a destiny; that the advantages and disadvantages of her early life had equally prepared her to answer a terrible call, and further that there was no one else who could have answered it.

Mrs. O'Malley has produced a fine work. The enjoyment of extraordinary opportunities for obtaining the material would have served her little if she had not known how to deal with it. She has recognised and laid stress upon the relevant things, and has thus produced what is practically an autobiography of Florence Nightingale's early years, much as the author of La Vie de Florence Rossignol might have written it.

The Treatment of Schizophrenia.

By LELAND E. HINSIE, M.D., *Professor of Clinical Psychiatry, Columbia University.* London: Baillière, Tindall and Cox. 1930. Pp. 206. 13*s.* 6*d.*

THIS book seems to be intended for the average psychotherapist of moderate attainments rather than for the research worker or the well-informed specialist. It contains a straightforward account of the treatment of early schizophrenia by means of free association, in the light of psycho-analytic theory. As a scientific contribution to the literature the book is negligible. It lacks adequate clinical data; the number of patients treated, the history and state of each, the period of treatment and of subsequent observation, the precise method of coping in these cases with the technical difficulties that arise in the psycho-analytic procedure—all these are lacking. One finds instead much knocking at open doors, robust attacks on positions long since surrendered, and summaries of points of view which are now familiar. The book, moreover, is loosely constructed, and the form of expression at times is not clear. However, the author has enthusiasm, and concludes that careful and patient treatment of early schizophrenia can do much good—an unexceptionable view, but one that is not yet widespread in this country, where orthodox opinion is pessimistic about the course of dementia præcox however it is treated. This little book is therefore welcome, and may stimulate much useful effort; its directions to the psychiatrist on general management and diagnosis are sound, and the Freudian views of the author do not lead to irrelevant speculation or unintelligibility. The final chapter, a survey of the literature of the subject, is wide and critical, though by no means exhaustive.

Il Colera.

By G. SANARELLI, *Director of the Institute of Hygiene in the Royal University of Rome.* Milan: Soc. An. Instituto Editoriale Scientifico. Viale Romagna 58. 1931. Pp. 559. 90 lire.

THIS work is one of the most comprehensive monographs we have seen on Asiatic cholera. Prof. Sanarelli is well known for his extensive researches into the pathogenesis of this disease published largely in the Annali d'Igiene. The book is divided into three parts. The first treats of the medical and historical geography, the nosology, pathological anatomy, bacteriology, experimental pathogenic action of the cholera vibrio, the presumed choleraic poison, and the pathogenesis of the disease. Attention is drawn to the work of Filippo Pucini of Florence, who in 1854 described the presence in the fæces of cholera patients of extremely mobile microbes having the shape of an *S*; in 1879—i.e., four years before Koch's researches—the results of Pucini's observations on the same organism were published in a review on the "Morbid Process of Asiatic Cholera." Later, Metchnikoff, from his experimental work, drew the conclusions that Koch's vibrio was the sole agent of Asiatic cholera, and might infect the water and persist there for many years after the cessation of an epidemic, preserving its virulent properties; also that the susceptibility of man to cholera has no constant relation to the virulence shown by the vibrio in laboratory animals. In the chapter dealing with pathogenesis Prof. Sanarelli has incorporated his own work which demonstrated the presence of vibrios in the gastric parietes as well as the intestinal, and the phenomenon of "epithallaxis" (Sanarelli's phenomenon) is fully discussed. The second parts of the book treat of the epidemiology of cholera, chapters being devoted to the predisposing factors, determining causes, bacteriological diagnosis, carriers, therapeutics, and preventive vaccination. The method of treatment by hypertonic intravenous injections devised by Sir Leonard Rogers is stated to have proved highly successful during the epidemic of 1911 in Italy, but other therapeutic measures are also fully described. The third part of the book deals with the propagation of cholera, the Indian and Mohammedan pilgrimages, the methods of protection to be used by local authorities in dealing with epidemics, and international methods of defence, with special reference to the Mediterranean and Egypt. The book is enriched with numerous woodcuts and admirable reproductions of histological specimens, mainly from Prof. Sanarelli's own collection. An extensive bibliography is attached to this excellent book.

Breast-feeding.

By MARGARET EMSLIE, M.B., Ch.B., *late Senior Assistant Medical Officer for Maternity and Child Welfare, County Borough of Croydon; formerly Senior Clinical Assistant, Hospital for Sick Children, Great Ormond-street, London; Medical Officer, Southfields Centre.* London: Humphrey Milford, Oxford University Press. 1931. Pp. 142. 5*s.*

ARTIFICIAL feeding has of recent years become so widely adopted that much of the lore of Mother Gamp with regard to the natural feeding of the normal baby has to be sought from pædiatricians. It is an unfortunate fact that breast-feeding has been more assiduously preached than conscientiously practised, and Dr. Emslie examines at some length the probable causes for this state of affairs. She begins her book with two clearly written and well-illustrated chapters on antenatal preparation for breast-feeding and the anatomy and physiology of the breast, particular attention being paid to abnormalities of the nipples. The remainder of the work is devoted to the establishment, management, and difficulties of breast-feeding, and a careful consideration of the ways in which premature weaning may be avoided. The author gives some 60 references, not selected on a very critical basis. In a future edition methods of stripping the breast by other than manual expression might well be dealt with at greater length. Both electric and water-suction breast pumps have reached such a high state of efficiency, although they are not yet much used in this country, that they certainly deserve less cursory reference. The efficiency of these pumps should be made widely known in view of the many occasions (as, for instance, the admission of an infant to hospital) when it is desirable to maintain the milk-supply over a long period, and when the tedium involved in manual expression or the use of the old-fashioned pump frequently leads to abandonment of the struggle. The book provides an up-to-date and practical guide to breast-feeding which should be of real service to physicians and nurses, and could be read with advantage by any intelligent mother.

Text-book of Anatomy and Physiology.

Sixth edition. By ELIZABETH R. BUNDY, M.D. Revised by S. DANA WEEDER, M.D., Assistant Surgeon, Germantown Hospital, Pa. London: J. and A. Churchill. 1930. Pp. 446. 10*s.* 6*d.*

THE aim of this book is to present the more salient features of anatomy and physiology in such a manner that they will be readily grasped by those who do not require too deep a knowledge of the subjects. The book is very well arranged, commencing with an introductory portion dealing with the histology of the tissues, and then proceeding to describe the bones in detail, and the skeleton as a whole. Thereafter the different organs in the body are considered both from their anatomical aspect and their physiology. This combination of "structure" and "function" throughout the book leads to an easy style, and presents a coherent story to the reader. The value of the book is further enhanced by the brief summaries which appear at the end of each section. A helpful feature is the introduction of applied physiology, in the form of "Clinical Notes," which appear throughout the book wherever there is an opportunity of showing the practical application of the points discussed. Very few errors are noticeable, but on p. 175 it is stated that saliva contains two enzymes, ptyalin and maltase; and on p. 178 the phraseology is such as to make one infer that lactase and invertase are the enzymes for the digestion of sucrose and lactose respectively. The section on the sympathetic nerves could be better written. Although the word "autonomic" appears in the index, there is no mention of it in the text; and the parasympathetic nerves are not referred to at all. The book is made more helpful by a plentiful supply of illustrations; and concludes with a brief review of the anatomical relations in the more important regions of the body, and a glossary of anatomical and physiological terms.

Die Funktion der Weiblichen Geschlechtsorgane und ihre Beziehungen zum Gesamt-organismus.

By Dr. ALEXANDER V. FEKETE, Privat-dozent, oberarzt der Graf-Apponyi-Poliklinik in Budapest. Berlin: S. Karger. 1930. Pp. 278. M.12.

THIS book is intended as a supplement to the ordinary text-books of midwifery and gynæcology and deals with subjects usually somewhat neglected in such text-books. The reader will find useful summaries of the German literature on such subjects as the secondary sex characters, the menopause, sterility, dysmenorrhœa, metabolic changes in the maternal organism in pregnancy, the pregnancy toxæmias, the endocrine system, and the female sex organs. English and American work seems to be entirely ignored. To those who wish to have the German literature on the subjects dealt with in handy form the book can be recommended.

Journal of Pathology and Bacteriology.

No. 3 of Vol. XXXIV. (pp. 301–400, March) contains the following: Experimental Tar Tumours in the White Rat, by A. F. Watson (Sheffield). Though it is quite easy to produce epitheliomas of the skin by the repeated application of tar in mice, it has hitherto proved almost impossible to bring off the same result in rats. These animals are now shown to be much less refractory if each application of tar is preceded by one of rat grease.—The Repair in vitro of Embryonic Skeletal Rudiments after Experimental Injury, by Janet S. F. Niven (Cambridge). Up to about five days' incubation injuries to the cartilaginous rudiments of long bones are readily repaired by cartilage; after this, by fibrous and osteogenic tissue. An injured femur continues to develop and differentiate in the normal manner.—Observations on Salmonella Agglutination and Related Phenomena: Fixation of Somatic Agglutinins by Receptors in Solution, by P. Bruce White (London). A technical paper for experts.—The Occurrence of Intranuclear Inclusions in the Nerve Cells in Poliomyelitis, by E. W. Hurst (London). In the early stages of the disease in monkeys and in the only human case examined.—New Lithium Selective and Enrichment Methods for the Isolation of Salmonella Organisms, by J. D. A. Gray (Liverpool). Staphylococci and salmonella are relatively resistant to lithium salts which may be added to media with advantage for their isolation.—Primary Carcinoma of Bronchus, by E. E. Atkin (London). The average age at death of patients with squamous-celled growths is higher than with those of other cell types. Squamous-celled growths are particularly liable to liquefaction and cavitation, and to secondary growths in the other lung.—Tumour Immunity: the Effects of the Eu- and Pseudo-Globulin Fractions of Anti-Cancer Sera on Tissue Cultures, by T. Lumsden (London). The euglobulin fraction contains all the antibodies which are toxic to cancer cells which may thus be concentrated tenfold.—The Effects of Repeated Intrapleural Injections of Electrolytes in the Rabbit—Acquired Insensitiveness of the Lung Epithelium to a Proliferative Stimulus: the Bearing of the Observations on Tissue Resistance, by J. S. Young (Leeds). One intrapleural injection of—e.g., strontium chloride causes a hyperplastic reaction in the epithelium of the marginal alveoli of the lung; a second injection gives no effect. This refractory state wears off in about three weeks.—A Case of Agranulocytosis with Intestinal Changes, by Bo Nordgren (Stockholm).—Capillary Hæmangeioma of Cerebrum, by W. G. Barnard and F. M. R. Walshe (London). These tumours are not uncommon in the cerebellum, but this seems to be the first certain example in the cerebrum where it occurred in the right temporal lobe.—Multiple Teratomata of Peritoneum, by W. G. Barnard (London). A woman of 40 with abdominal symptoms of three months' duration was found at operation to have an ovarian cyst with teratomatous tissue in its wall, and several hundred small teratomatous tumours scattered over the peritoneum, in which nervous tissue was particularly prominent (see p. 1360).—Obituary Notices of A. Leitch (portrait), H. J. B. Fry, Richard Muir (portrait), G. E. Birkett, and A. G. R. Foulerton.

IRRADIATION WITH THE ALPINE SUN QUARTZ LAMP.—In reply to the penultimate sentence of a review of Dr. Hugo Bach's book in our issue of April 25th (p. 921) Dr. R. King Brown writes to say that the translation was prepared from the seventeenth German edition (1927) and brought up to date by the inclusion in an appendix of a recent summary by Dr. Bach on the present position of light treatment, which appeared in *Strahlentherapie.*

GENERAL MEDICAL COUNCIL.

SUMMER SESSION, JUNE 2ND–5TH, 1931.

Committee Business.

EDUCATION AND EXAMINATION COMMITTEES.

Sir Norman Walker presented the report of the Examination Committee. The account it gave of the inspection and visitation of final examinations deserved, he said, close study. The Universities remaining to be visited were mainly on the other side of the Irish Channel; the visitations would probably be completed this year, but not in time for report to the Council's November session. Prof. James Rice, who had been appointed deputy-visitor to the pre-registration examinations, had visited the examinations at Glasgow (Triple Board), London (Society of Apothecaries), and the Universities of Edinburgh, Manchester, Sheffield, and Liverpool. His preliminary reports were being regarded as confidential until he had completed his final report. He had gained a great deal of useful information.

The President presented the Joint Second Interim Report of the Education and Examination Committees on the report by the Departmental Committee of the Ministry of Health on maternal mortality and morbidity. At the last winter session of the Council it had been agreed that the President be requested to write to the Minister of Health pointing out the desirability of providing further accommodation for the teaching of practical obstetrics to medical students. The Minister had replied that none of the hospitals transferred to the London County Council under the Local Government Act possessed a maternity unit large enough for teaching purposes, but that the London County Council were contemplating the provision of a new maternity hospital of 100 beds with facilities for teaching. Provincial medical schools might, the Minister suggested, approach their county borough council to grant facilities in the maternity wards of its hospitals. On the question of a more equitable distribution of confinement cases between medical students and pupil midwives, he referred the Council to the report of the Departmental Committee on the training and employment of midwives, which recommended that pupil midwives in a medical school area should use only material in excess of the needs of medical students. The licensing bodies, replying to the reports, were generally agreed against six months' exclusive instruction in obstetrics, and 30 cases of labour instead of 20, but there was a large measure of assent to the other proposals of the Departmental Committee.

The Joint Committee advised that the Council should delay final action until they received the series of reports by its inspector on the qualifying examinations in midwifery, which were approaching completion.

Sir Robert Bolam, in seconding the adoption of the report, pointed out that some maternity hospitals in connexion with medical schools might find it difficult to do without the grant which they received for pupil midwives.

The President replied that this grant was not payable to all hospitals.

The report was adopted, and the Council directed its circulation to the licensing bodies.

The same committees presented another report on the report by the Society of Medical Officers of Health on the place of preventive medicine in the medical curriculum. The President remarked that the committee sympathised with most of the recommendations of the Society, though some of the details applied to the schools rather than to the Council. The interim report was ordered to be circulated to the licensing bodies. A final report would, said the committee, be presented to the Council on the completion of the series of reports by the inspectors of the final examination.

PUBLIC HEALTH COMMITTEE.

Sir John Moore presented the report of this committee and its recommendation:—

> "That in view of the difficulty which some licensing bodies have felt in putting the new D.P.H. rules into operation by Oct. 1st, 1931, the Council desire to inform the licensing bodies that the standing subcommittee of the Public Health Committee of the Council is authorised to consider any exceptional cases submitted to it as heretofore. Such authorisation would include power to grant permission to continue under the old rules during a year of grace up to Oct. 1st, 1932, or such partial adoption of any, or all of the new rules within the same period."

Mr. Monsarrat desired to postpone the operation of the new rules for a year, saying that some of the teaching bodies were apprehensive lest they should have no chance of putting forward their views.

Sir George Newman said that 22 of the licensing bodies had accepted the very slight amendments to the rules, and only six had found difficulty. The amendments had not been initiated in the Council, but the Council had been approached by licensing bodies. Two or three large schools had already made the necessary arrangements to conform.

Dr. Letheby Tidy thought that postponement would involve the main bodies in serious difficulties. The opinions of the bodies could be collected without postponement.

Sir John Moore and Sir Robert Bolam deprecated any alteration in or postponement of the new regulations now that the schools had taken trouble to conform to them. The latter said that advice had been taken from many important sources throughout the country before the rules were laid down, and Mr. Monsarrat's proposal asked the bodies to do something they were quite entitled to do without invitation. The alterations in the new regulations were not of great moment.

Prof. Sheen said that his faculty regarded the alterations as neither few nor unimportant, and desired an opportunity to express an opinion on them, which they had not yet had. Their professor had never been consulted. What was the good of getting the opinion of the licensing bodies except with a view to amending the rules? The bodies were in a coerced position, but they did not like the rules.

Prof. Johnston said that his faculty had not welcomed the rules at all, but had felt that they had no option save to conform. The only point they had welcomed was the substitution of an academic year for a calendar year. No member of the Council was engaged in training men for the D.P.H., and the teachers ought to be consulted.

Sir John Moore reiterated that the recent revision had not been undertaken on the initiative of the Council, but at the request of certain licensing bodies.

Mr. Monsarrat, proposing

> "That the licensing bodies be invited to express their views on the new regulations regarding the course of instruction for the diploma in public health,"

said that there was a body of important experience in the country of which the Council had not availed itself. When the Council received their opinion it would, of course, consider making use of it.

Sir Robert Bolam moved that the licensing bodies be invited to make any observations they desired to make, as he thought that most of them would not level of 20–40,000 cubic feet per minute to 16,000, for most of the fresh air admitted has been discharged to the outlets without having been any benefit to the occupants of the room. Why Sir FRANK BAINES's memorandum[1] setting out these experiments in detail has only just been presented to Parliament does not appear. The information has presumably been asked for by the committee now sitting of which Dr. ALFRED SALTER is chairman and before which Sir LEONARD HILL has again expressed his views. The proposed changes are so modest and so closely in harmony with all that is modern in the teaching of ventilation that their adoption should be immediate. Warmer feet and cooler heads will be needed this session.

HOSPITALS AND THE EXPENSE OF TRAFFIC CASUALTIES.

THE Minister of Transport has undertaken to remove one of the flaws in last year's Road Traffic Act by repealing subsection (3) of Section 61 which victimised the free conveyance of the local cricket team or school-children's outing. This step, he says, can only be taken by a one-clause Bill treated as non-controversial, and no other amendment of the Act can be undertaken. Otherwise it might have been possible to invite his aid in respect of another part of the Act which was framed to assist hospitals but which is not operating to their proper advantage. Part II. of the Act arranged for the compulsory insurance of the user of a motor vehicle against third-party risks. It has been notorious that the resources and accommodation of our hospitals have been considerably strained by the requirement of treating local traffic casualties. It was felt that, if a patient, injured by a motor accident, recovered compensation under the system of compulsory insurance, the hospital ought somehow to be recouped the expense of his treatment. Section 36 of the Act sought to give a remedy by enacting that, if the insurance company became aware that a person had received treatment in a hospital for fatal or other bodily injuries arising out of a motor traffic accident, the company, when making a payment under the Act, should also pay the hospital the reasonable expenses of such treatment up to a maximum of £25 for each patient. A proviso was added which excluded the application of the foregoing provision where a charge has been made by the hospital for such treatment.

Experience of the working of this enactment is unsatisfactory. It is even possible that in many cases the hospitals would have been better off if the enactment had not been passed, because not a few patients regard compulsory insurance as a complete substitute for voluntary payment to the hospital. Often, of course, the system of compulsory insurance amounts to nothing at all. A motor-coach, let us suppose, runs amok near a crowded pavement and fills the casualty ward of the local hospital. It is ascertained that the vehicle became suddenly unmanageable through a broken axle caused by an undiscoverable flaw in the metal. The accident, say the coach-owners, was not due to negligence but to an act of God; in consequence no payment can be made. Where there is a reasonable prospect of the insurance company making some payment, the settlement may be hung up for a twelve-month while the law courts decide the issue of liability. At the end of that period, if the insurance company succeeds in escaping liability, it is frequently too late to trace the patient and extract from him a voluntary payment; moreover, his sense of gratitude may by that time be less acute. The common-sense practice would be for the patient, when his treatment is ended, to make the hospital such contribution as he can afford, and for this contribution to be deemed a payment on account—an advance which should not prevent the insurance company from making its statutory payment eventually when liability is established. Unfortunately such a practice seems to be ruled out by the proviso (already mentioned) which excuses the company from paying the hospital "where a charge has been made by the hospital in respect of such treatment." The hospital wants three things—first, to recover the expenses of treating the patient; secondly, to recover them promptly; and thirdly, to recover them without endless labour in tracing ex-patients. When a traffic accident brings a patient into the hospital ward, it is easy to ascertain the insurance company concerned, but it is difficult to find out enough about the patient (often a stranger to the district) to ensure the hospital getting into touch with him several months afterwards. The situation seems to call for some amendment of the law. It is for the hospitals to consider what is feasible.

EXPERIMENTAL PRODUCTION OF GALL-STONES.

GALL-STONE formation is generally attributed either to infection, metabolic disorder, or biliary stagnation. Nowadays most clinicians think that a primary gall-bladder infection, probably blood-borne, is the fundamental cause of almost all types of gall-stone, including even the pure cholesterol monolith, which was formerly regarded as of metabolic origin. The factor of biliary stagnation has received less attention of late, although it has often been suggested that the pregnant uterus may predispose to cholelithiasis by mechanical hindrance of the flow of bile.

Since through cholecystography we have come to recognise more fully the concentrating activity of the gall-bladder, it has seemed more likely that a prolonged stay in the gall-bladder may produce a bile so thick that minute solid particles may be precipitated and form nuclei for calculi. Interesting experimental work by WESTPHAL and GLEICHMANN[1] supports this hypothesis, and suggests that, at least in the animals used, stagnation of the bile is the essential cause of gall-stones. These workers used in all 50 dogs for their experiments, but for various reasons they have excluded 10 of these in drawing their conclusions. In 16 dogs the biliary flow was artificially obstructed for periods of from 1 to 11 days; in 22 it was obstructed for periods of from 26 to 235 days. As far as possible an aseptic stagnation was produced, and this was done by ligaturing the bile-duct at various sites and for various lengths of time. In some cases there was total obstruction over long or short periods; in others it was only partial. Further, in some dogs artificial infection of the gall-bladder was carried out in addition, while yet others had excess of cholesterol in their diet. Infection occasionally developed during the experiment as a result of the operation. Always there was a very thorough examination of the bile—removed through a needle—at the beginning and end of the experiment. In a considerable proportion of cases concretions in the bile were produced, varying from almost microscopic particles to the size of large peas or beans, and consisting mainly of pigment. In one case there were definite concentric layers, but in none of them was a definite cholesterol deposit found. A striking feature of the results is that such concretions were produced by simple partial obstruction as frequently as by total obstruction, and that they were apparently independent of any coexistent infection. Indeed, infection sometimes seemed to prevent concentration of the bile and lessen the incidence of concretions. An obstruction of one or two days was enough to produce the first signs of "stone formation," though they disappeared when the obstruction was removed; thus of the 16 dogs in which the obstruction lasted less than 12 days, 13 showed definite naked-eye precipitations in the bile.

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[1] House of Commons (Ventilation). Cmd. 3871. H.M. Stationery Office. 1931. 1s.

[1] Gallenwegsfunktion und Gallensteinleiden (v). Westphal K., Gleichmann, F., and Mann, W. Berlin: Julius Springer. 1931. Pp. 227. R.M.18.

The burden of these results is that bacteria play only a minor and secondary part in the causation of gall-stones, and that infection is certainly unnecessary for their production. Though the conditions are not applicable directly to man without reserve, their significance is clear, and must impress the reader with the importance of an obstructed flow of bile.

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PUBLIC HEALTH IN SCOTLAND.

THE Department of Health for Scotland has issued its second annual report, some of the main features of which we summarised recently.[1] The year 1930 is described as a peculiarly difficult one, but the difficulties to be overcome were mainly external: the continued widespread unemployment and the transfer to the new local authorities of poor-law medical service and school health administration. The number of detailed adjustments involved in this transference must have been enormous, and all the while the administrative activities had to go on steadily over the old field. In form the report follows the lines established seven years ago, and adds another to a series which gives a fairly complete picture of the historical growth of public health in a small and well-organised nation. During the year research has been raised to a better plane. The Department set up a scientific advisory committee on medical administration and investigation, with Dr. PARLANE KINLOCH as chairman, representing all the chief departments of medical and biological research. On the advice of this committee, of which Sir WALTER FLETCHER is a member, a report was issued on the Aberdeen investigation into maternal mortality. Early in the year, with the financial help of the Empire Marketing Board, the Department's officers organised a large scale investigation into the effect of raw and pasteurised milk on the growth of 20,000 children in 67 Lanarkshire schools. Research has continued into the importance of the mineral balance in nutrition, the special problem being the mineral differences between human and cow's milk. A special investigation is being made into the incidence of infection in tuberculous milk. Some 10,000 samples are to be analysed biologically at five laboratories by an identical technique, the details of which are to be fixed, with the consent of the Medical Research Council, by the bacteriologists themselves. Not a bad record for the first complete year of a new department. Meanwhile, the staff has been strengthened by the addition of a bacteriologist and a medical statistician. The analysis of tuberculosis returns is correspondingly elaborate; the decline continues to be steady and considerable. In 1920 the death-rate from all forms was 124 per 100,000 of population; in 1930 it was 88. In respiratory tuberculosis the numbers fell from 4194 in 1920 to 3024 in 1930, equivalent to rates of 86 per 100,000 and 62. The decline is steeper than in the general death-rate.

School health administration is 23 years old in Scotland, and the figures recorded show a better standard of cleanliness and a steady amelioration in malnutrition, rickets, and defective teeth. The very large field covered by school treatment can be grasped only when the thousands of cases of eye defects, ear defects, skin diseases, throat diseases, and the like, are scrutinised in the tables. When it can be said that in a total attendance of 741,801 children, 263,334 were examined medically, 82,634 re-examined, and 146,332 subjected to special examination, vigilance may be regarded as fairly effective. Now that the Scottish Education Department has made a medical man a principal assistant secretary and appointed another medical man as inspector of physical education, the integration of the school health service with physical education will no doubt proceed more rapidly. In the Highlands and Islands medical service and in maternity and child welfare the work is now largely organised routine; but the former is still growing, as shown by the appointment of consultant and operative surgeons for the northernmost fringe, including Shetland and Lewis. Under the Housing Act of 1930 leeway is being rapidly made up, and the programme in contemplation almost reaches the figure suggested by the Royal Commission on Housing. Other social services are kept running at full pressure. The poor-law has been lightened by the transfer of 33,000 cases to unemployment insurance, but even so the burden reaches 37 per 1000 of the population.

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[1] THE LANCET, June 6th, p. 1258.

Unemployment is nearly everywhere worse in Scotland than in England.

In the very full section on national health insurance and pensions a new departure is the chapter on Morbidity in the Insured Population. For nearly 20 years insurance practitioners have made periodic returns of their cases of sickness. Some time ago a departmental committee inquired as to the statistical use to be made of those returns; but, in Scotland at least, the investigation did not lead to any statistical results until now. Within its first year, the Department was able to make arrangement with the approved societies to get periodic information about certificates of sickness. The old system of medical returns has been dropped, and the new system began last July. The chapter containing the preliminary statistical results is worth careful study. In the fullness of time the facts about certification will become an important index of the incidence of sickness in the industrial community. One striking fact is brought out—namely, "that morbidity, so far as concerns mere frequency of certification, is quite at variance with mortality in which increasing age is accompanied by a progressively higher death-rate." In certification "the frequency of a disease is in inverse ratio to its fatality," and this paradox is illustrated by many group facts. The biggest percentage of sickness certificates comes from the age-group 16–19 and, except for the years 50–59, the ages above 19 show a progressive diminution. This is a hint for more intensive investigation of the early ages. The Department is to be congratulated on a well-loaded and well-presented report.

ANNOTATIONS

PHYSIQUE AND HEALTH IN KENYA.

It is often stated that native tribes manifest a much finer physique and enjoy much better health than the decadent inhabitants of civilised countries. Some field work on two native tribes in Kenya[1] suggests strongly that the physique of these people is often inferior to that of Europeans and that disease is quite as prevalent among them as elsewhere.

Among 14,440 native men employed on the Uasin Gisy Railway, the death-rate was 35·4 per thousand, and 5331 were admitted to hospital in a year. The principal causes of death are diseases of the respiratory system, especially pneumonia and tuberculosis. Ulcers of the leg and intestinal disturbances account for much sickness. The investigation here reported was undertaken with the primary object of obtaining more information about the incidence of disease in natives in reserves and their diet. A physical examination was made of 6349 Kikuyu adults and 2500 children and of 1546 Masai adults and 254 children. The Akikuyu are a Bantu tribe, numbering about three-quarters of a million and occupying part of the highlands of Kenya between the Equator and one degree south. Their diet consists chiefly of cereals, plantains, tubers, legumes, and green leaves; 60 per cent. of the diet of the men consists of maize or millet and a further 25 per cent. of sweet potatoes. The women have a virtual monopoly of the green leaves. Very little cow's milk is available and the goats are used mainly as currency instead of as a source of milk or meat. Edible earths are a common article of diet, especially among the women and children. Magadi soda is also largely used as salt. The Masai are a pastoral tribe living on milk, meat, and blood. The non-fighting classes also eat a certain amount of beans, millet, bananas, arrow-root, maize, sugar, and honey. Berries are taken by warriors on hunting expeditions and by pregnant women. An analysis of the chemical composition of the native foodstuffs, earths, and mineral waters showed that the Kenya leaves have a strikingly high calcium and chlorine content; their addition to a diet of cereals and potatoes would therefore tend to correct the calcium deficiency. The manganese content of the leaves and of the plant ash used as salt substitute was also found to be very high. Some of the edible earths are rich in sodium, phosphorus, or iron. The total solids and fat in Masai milk are high. The Kikuyu women's special foods, therefore, increase the intake of calcium and sodium. The diet of the Kikuyu male is adequate in protein but very low in fat and calcium. The Masai diet, in which there is less difference between the sexes, contains a liberal supply of mineral elements and a large excess of protein and fat, but is low in carbohydrates, cellulose, and other indigestible residues.

It was found that the Masai grow more rapidly than the Kikuyu and are on an average 5 in. taller, 23 lb. heavier, and 50 per cent. stronger; they are larger in the chest and smaller in the abdomen. The Kikuyu children commonly showed signs of malnutrition and rickets, a high incidence of dental defect, anæmia, spongy gums, enlarged tonsils, and cervical adenitis. The Masai village children presented a totally different picture, defects and anæmia being uncommon. The adult Kikuyu suffered more from yaws, malaria, conjunctivitis, helminthiasis, and ulcers, but the diseases of the Masai were principally constipation and arthritis. The Masai had no tribal immunity to pulmonary conditions—in gaol they seemed peculiarly susceptible—and their superior resistance under natural conditions was probably correlated with diet and environment. A study of the routine hospital and prison diets in Kenya showed that they were markedly deficient in calcium. The Kikuyu women were healthier than the men.

The committee desire to make it clear that the investigations are only preliminary; nevertheless, some of the problems raised are fundamental. The striking difference in physique between the Masai and the Akikuyu raises the question to what extent diet can affect the stature and physique of a race, and recalls the Scottish experiments in which additional milk for school-children was followed by an increased rate of growth in two successive years. There was, however, nothing to show whether, if the milk had been continued, there would have been an ultimate difference in adult stature. Another most important problem is the possibility that diet may influence susceptibility to certain infectious diseases. This investigation brings forward data to support the suggestion that deficiencies in diet, abnormal composition of the blood, and reduced susceptibility to certain diseases may be correlated. The problem concerns not only public health authorities but also agricultural authorities. A general improvement of agriculture and animal husbandry amongst the Akikuyu would almost certainly be accompanied by an improvement in the health and working capacity of the natives. The problem is not confined to Kenya; it appears to exist in many of our tropical dependencies. The loss of health and efficiency attributable to deficient diet is therefore of considerable economic importance. The Empire Marketing Board is to be congratulated on its foresight in promoting research of this kind.

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[1] Medical Research Council Special Series No. 155. The Physique and Health of African Tribes. By J. B. Orr and J. L. Gilks. London. 1931. Pp. 82. 2s.

THE BERCOVITZ TEST IN PREGNANCY.

A YEAR ago Z. Bercovitz[1] described a pupillary test for pregnancy: the instillation into the eye of one drop of a 10 per cent. solution of sodium citrate mixed with five drops of the patient's blood. A positive reaction consisted in a dilatation or contraction of the pupil compared with that of the other side. The reaction has lately been tested by A. J. Gordon and S. W. Emmer[2] on 110 consecutive patients examined at the prenatal clinic of Newark City Dispensary. A number of doubtful reactions occurred in negro women, in whom it is sometimes very hard to read the pupil, but in this series no patient who was not pregnant gave a positive reaction, although several cases of pregnancy gave negative reactions. In the opinion of the investigators the Bercovitz test is a valuable aid to the diagnosis of pregnancy. It is certainly much simpler and quicker than the Zondek-Aschheim test and can be done at once in the consulting-room or clinic.

MENTAL CHANGES IN PERNICIOUS ANÆMIA.

AT a recent quarterly meeting of the Royal Medico-Psychological Association Dr. Norman Phillips, of St. Andrew's Hospital, Northampton, initiated a discussion on the mental disorders associated with anæmia of pernicious type. In his experience these ranged from slight modification of character shown in irritability and unstable moods to definite paranoia with delusions of persecution and suspicion. Such mental states might occur at any stage of the anæmia and Prof. G. M. Robertson recounted a case in which acute mental symptoms developed quite early. Dr. W. F. Menzies remarked that he had seen only four cases of the association at Cheddleton of recent years, but a study of the literature would suggest that if deviation from the normal mental outlook be included such cases are not uncommon. R. C. Cabot noted mental symptoms in 104 (15 per cent.) of 647 cases of pernicious anæmia collected from American sources, and H. W. Woltmann reported[3] that in 1498 cases of this disease treated at the Mayo Clinic between 1917 and 1924, 4 per cent. had definite psychoses whilst 35 per cent. suffered from milder mental disorders. It is therefore rather singular that only one of five text-books on psychiatry published in this country refers to the mental aspect of pernicious anæmia. In a review which appeared not long ago in our own columns[4] Dr. D. McAlpine described varying degrees of mental disturbance in 11 out of 17 cases of pernicious anæmia whose mental condition he had examined. Three showed simple depression with lack of mental energy; one of these committed suicide despite adequate liver treatment. In four cases there was a mild state of mental confusion associated with failure of memory, indifference and a tendency to somnolence. In three the disturbance was more profound and was typical of a toxic psychosis; two of these had begun abruptly with confusion, excitability, amounting in one case to mania, and ideas of persecution and suicide. The majority of Dr. McAlpine's cases showed signs or symptoms of subacute combined degeneration of the spinal cord, but he could establish no direct relationship between the degree of anæmia and the intensity of the mental symptoms. Other writers have described a similar train of symptoms. Sometimes the depression and insomnia have suggested a manic-depressive state, but the recognition of a glossitis or an examination of the blood has led to the correct diagnosis. In the milder cases a diagnosis of neurosis or neurasthenia is apt to be made. Variability in mood, mental as well as bodily fatigue, difficulty in concentration, lack of interest, a sense of apprehension, and a tendency to somnolence are the commoner symptoms, and coincident with this altered mental outlook are frequently found early symptoms of spinal cord involvement, such as paræsthesiæ or referred pains. The blood picture is rarely that of a frank pernicious anæmia; as a rule the degree of anæmia is slight and an ordinary blood count may show no distinctive features. F. W. Langdon has drawn attention[5] to a group of cases in which the nervous and mental symptoms precede the typical picture of pernicious anæmia. His views met with little favour at the time but facts have since come to light in support of them. In Scandinavia for instance, E. I. Warburg and S. Jorgensen have described[6] the association of psychoses and neurasthenic states with achylia gastrica and megalocytosis. They remark that the advent of pernicious anæmia is rather a late stage in this condition; a low colour index may be present at an early stage. The effect of liver treatment on the mental symptoms seem to vary, but as recoveries have been reported the importance of recognising these cases early is evident. At the discussion mentioned Col. J. R. Lord remarked on the importance of a vigorously functioning liver in preserving a cheerful mentality; a morning liver-cocktail might not be an unwise habit. In any case it would be prudent to make inquiry for a history of glossitis and an examination of the gastric contents and of the blood—especially for megalocytosis—in neuroses and psychoses, especially of the toxic type, appearing for the first time in persons over the age of 35.

TENSION OF GASES IN THE TISSUES.

THE tension of the gases in the body tissues generally has not received the same attention as their tension in the blood. The statement has been commonly accepted that in the tissues carbon dioxide, in virtue of its manufacture there, is under a positive pressure; whereas oxygen, because of the demand for it, is at a very low or even negative tension. Dr. J. Argyll Campbell's new investigations[7] are based on the fact that when a gaseous phase and a liquid phase are brought in contact the gases in the two phases commingle with each other, until eventually the pressures of the individual gases in both are equal. In carrying out the observations nitrogen is usually injected into the tissues, and after equilibrium is established the gas is withdrawn and analysed and the pressure of its components is determined. Dr. Campbell says that in no tissue examined was the tension of oxygen below 20 mm. Hg; and it usually varied between 20–30 mm. He concludes that so great is the capillary supply, that even in resting muscle it is not possible to have a zero oxygen tension. In no case was there any evidence of the tension of oxygen in the tissues exceeding that in the arterial blood. A number of observations were undertaken bearing on the controversy on secretion versus diffusion of oxygen through the pulmonary alveoli at high altitudes. Animals were exposed to low pressures of oxygen for prolonged periods and it was found that the oxygen tension in the tissues fell, and remained low even after acclimatisation. From this it was inferred that if secretion was taking place it was not helping the tissues in any way. It was shown also that the coincidently lowered tension of the carbon dioxide in the tissues had no great effect upon ability to tolerate the low oxygen pressure in the inspired air. This was demonstrated by the fact that although cats and rabbits both exhibited the same low CO_2 tension, cats did not tolerate the low O_2, although rabbits did. It was not found possible to lower the O_2 tension in the tissues more than 40 per cent. of normal without the risk of death; hence the idea of a "nil" tension of this gas is held to be absurd. Oxygen was almost absent from the lumen of the gut, this gas being readily absorbed by the mucosa. It was shown that the mucous membrane of the stomach may absorb as much as 12 c.cm. of oxygen per minute. Discussing air swallowing in certain dyspeptics, Dr. Campbell suggests that it is possible that air is swallowed to supply oxygen to an abnormal mucous membrane. The gases in the large intestine, as would be expected, were found to vary with the diet, milk giving a large preponderance of hydrogen, a vegetable diet yielding marsh-gas. The high tension of these gases leads to their absorption, and excretion by the lungs, but the hydrogen being relatively unabsorbable is liable to produce distension. It has been estimated that six litres of carbon dioxide is liberated daily in the gut by the action of acids upon the sodium bicarbonate of the intestinal juices; this gas is readily absorbed, and excreted by the lungs. Dr. Campbell also indulges in speculation about the possible cause of tetany. Having shown that after muscular exertion the oxygen tension in the tissue is 25 per cent. above normal he analysed various predisposing causes of tetany, and found that in 11 out of 14 types experimentally produced there was an oxygen deficiency in the tissues. If one factor alone is responsible, the most constant is oxygen-want. It is suggested therefore that tetany is an effort to raise the oxygen tension.

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[1] Amer. Jour. Obst. Gyn., 1930, xix., 767.
[2] Ibid., May, 1931, p. 723.
[3] Amer. Jour. Psych., 1924, iii., 435.
[4] THE LANCET, 1929, ii., 643.
[5] Jour. Amer. Med. Assoc., 1905, xlv., 1635.
[6] Act. Med. Scand., 1928, lxix., 537; and 1929, lxx., 193.
[7] Physiol. Rev., 1931, xi., 1.

MULTIPLE TERATOMATA.

TERATOMATA are generally explained as examples either of parthenogenesis or of the inclusion within the body of one of the members of a pair of identical twins arising from the separation of cells in the early divisions of the egg. Certain rare cases occur, however, which cannot with reason be brought within either of these categories, and their existence raises a suspicion that neither hypothesis may be necessary. Such an example is recorded by Dr. W. G. Barnard from University College Hospital.[1] A woman of 40 had ascites and abdominal discomfort for three months. At operation a cyst was found in the left ovary and numerous small tumours scattered about the peritoneum with larger masses in the omentum. She died 12 days later of peritonitis. The cyst, which contained no hair or sebum, was bilocular and in the diaphragm between was well-formed bone. Projecting from the ovarian surface of the cyst and continuous with the diaphragm was a solid lump of tissue which showed the same histological structure as the growths in the omentum and on the peritoneum, of which there were more than a hundred. All were typical teratomas and contained undifferentiated cells, spindle cells in groups and bands, cartilage, bone, a tooth, skin, columnar mucous epithelium and brain, including glia and nerve ganglion cells indistinguishable from the normal. No placental tissue was identified. To explain these facts a great many hypotheses might be made up. But the only reasonable interpretation seems to be that some months before the patient's death the tissues in the ovarian cyst broke out and were disseminated about the abdominal cavity, not as developed teratomata but as single cells or at most small groups of cells, each of pluripotent or totipotent capacities and capable of giving rise to most sorts of tissue. Dr. Barnard's and other cases seem to make it certain that such cells do or may exist or arise in the adult body; they would be more useful if they appeared in amputation stumps and achieved the regeneration of a limb as they do in lizards' tails. And it is plainly possibly that they might be the source of all teratomata.

DRAINAGE OF THE AQUEOUS HUMOUR.

IT is a somewhat humiliating reflection that even now there is no universal agreement among ophthalmologists on some of the fundamental facts of ocular physiology. Especially is this true of problems connected with intra-ocular tension and the circulation of fluids in the eyes. A recent controversy concerns the drainage of the anterior chamber, a matter of the first importance in connexion with glaucoma. What is generally taught is that the normal drainage of the aqueous humour takes place via the spaces of Fontana and Schlemm's canal, a slit-like space encircling the cornea, and connected both with lymph spaces and veins. W. S. Duke-Elder[1] maintains that only where intra-ocular pressure is abnormally increased is there any circulation of the intra-ocular fluid at all, properly so called, but that any change in the composition of the aqueous takes place by dialysis between it and the capillaries of the iris and ciliary body. Only in case of raised intra-ocular pressure can the condition of the venous circulation allow of the actual flow of aqueous fluid into the general circulation via Schlemm's canal. Lately this view has been challenged by Mr. F. Ridley,[2] who maintains that Schlemm's canal has no direct connexion with the venous system, but that there is a constant drainage of aqueous through the cornea into the conjunctival sac and that this drainage takes place chiefly via the filtration angle, where Descemet's membrane is absent. This thesis he supports by experiments on excised pigs' eyes and on the eyes of living rabbits. He maintains that the physiological conditions are such as to determine the constant passage of fluid through the cornea, that the flow takes place chiefly at the filtration angle and that its rate is determined by the intra-ocular pressure. We know by everyday experience that solutions of drugs such as atropine enter the eye from the conjunctival sac. The assumption that the fluid contents of the eye can pass outwards by the same route does not, on the face of it, appear improbable. On the other hand, Mr. Duke-Elder,[3] criticising Mr. Ridley's work, puts forward an experiment which to his mind is conclusive. A solution of methylene-blue is introduced into the anterior chamber of an anæsthetised dog under a pressure not exceeding 2 mm. In a minute and a half the episcleral veins are deeply dyed, whereas there is no coloration of either cornea or conjunctival sac. Mr. Ridley[4] replies that this experiment is irrelevant to his thesis. The methylene-blue, he says, has not reached the episcleral veins via Schlemm's canal, but via the capillaries of the ciliary body and iris by a process of simple diffusion. He objects that a minute and a half is too short a time for diffusion through the cornea into the conjunctival sac to appear. If that is all, however, it would surely be easy for him to repeat the experiment and allow a longer time for the appearance of the blue in the conjunctival sac. It does not appear that Mr. Ridley has succeeded in proving his point that the part played by Schlemm's canal in the drainage of the intra-ocular fluid is negligible. In this connexion we may recall a theory put forward by Prof. Arthur Thomson[5] at Oxford many years ago to the effect that that part of the ciliary muscle which is attached to the scleral spur takes an active part in widening Schlemm's canal, causing a negative pressure in it so that every act of accommodation must tend to facilitate drainage of the aqueous fluid. These physiological problems are not easily solved, but until agreement is reached there seems to be a certain futility about discussion of the pathological problems connected with glaucoma. Meanwhile treatment, and especially operative treatment, must remain largely empirical.

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[1] Jour. Path. and Bact., 1931, xxxiv., 389.

[1] Nature of the Intra-ocular Fluids. Monograph Supplement to the Brit. Jour. Ophthalmol., 1927, iii., 77.

[2] Brit. Jour. Exper. Path., 1930, xi., 217; Trans. Oph. Soc., 1930, l., 268.

For a summary of the modern views on these physiological problems we may refer readers to an address by Mr. Duke-Elder published in THE LANCET of Jan. 4th, 1930.

ALCOHOLIC FERMENTATION.

EVERYONE is aware that the Lister Institute is doing pioneer work on filtrable viruses and accessory food-stuffs. The report presented to the annual general meeting on June 10th makes it clear enough that there is a similar liveliness in the department of biochemistry. During the year a definite stage was reached in Dr. R. Robison's investigations of the phosphoric esters formed during alcoholic fermentation. The attempt to separate and identify the component esters of hexosemonophosphate was begun some years ago in collaboration with Dr. E. J. King and the isolation of a glucosemonophosphoric ester has already been reported, but the properties of this compound showed that it still contained about 10 per cent. of some other ester of lower reducing power. The final stage in its purification has now been achieved. Evidence of the homogeneity of this ester was given by its behaviour on hydrolysis with acids, while the examination of the products obtained from it by hydrolysis and by oxidation and dephosphorylation have proved that it is a monophosphoric ester of glucose. Further evidence was obtained that the phosphoric acid group is attached to the terminal carbon atom of glucose and this conclusion has been confirmed by the study of its methylated products, carried out by Dr. W. T. J. Morgan, Dr. King, and Dr. R. R. McLaughlin. A second ester also isolated from hexosemonophosphate was shown to be very similar to Neuberg's fructosemonophosphate, while considerable progress has been made towards the separation of the residual fraction, in which at least one unidentified ester is known to be present. It had been previously mentioned that hydrolysis of fructosediphosphate by bone phosphatase does not yield pure fructose but a mixture of sugars containing glucose and fructose. A similar result was obtained on hydrolysis of the pure glucosemonophosphate by phosphatase. This increased lability of the hexose molecule during enzymic removal of the phosphate group is of much interest and may possibly throw some light on the mechanism by which esterification with phosphate facilitates the reactions occurring in carbohydrate metabolism.

Experiments have also been made by Prof. A. Harden and Miss M. G. Macfarlane (Carnegie Fellow) on the reducing properties of yeast with special reference to the alleged need for a co-reductase. Dried yeast which has been so thoroughly washed that it will not ferment a hexosephosphate without addition of coenzyme does not reduce methylene-blue, but can be reactivated by the addition of boiled yeast extract. Such a preparation can also be reactivated by the addition of a lactate, without any other addition. The reduction of methylene-blue which then occurs is accompanied by the evolution of a quantity of carbon dioxide approximately equivalent to the methylene-blue reduced, and arising presumably from the decomposition of the pyruvic acid formed from the lactate by oxidation. This observation affords no ground for the assumption that a co-reductase is required.

UPPER RESPIRATORY INFECTION AND RHEUMATISM.

THE relation of upper respiratory infection to rheumatism in childhood has long been argued over. Their association has indeed been noted for two centuries or more, though it remained until lately in the limbo of "clinical impression." W. P. S. Branson, in 1912, maintained that the mucous membrane of the nasopharynx provides the port of entry of the causative organism, and J. A. Glover in his Milroy lectures of 1930 adduced evidence of droplet infection.[1] Perhaps the most valuable contribution to the subject, however, is B. E. Schlesinger's description[2] of epidemics of nasopharyngeal infection in a convalescent home for rheumatic children. He found that the acute infection was often followed, after a latent period of 10–21 days, by acute arthritic or cardiac manifestations. This latent period suggests an allergic factor in the disease, and Schlesinger's original observation has opened up a new line of rheumatic research. Similar epidemics of upper respiratory infection in wards of convalescent rheumatic children at the Cheyne Hospital and the Lancing Convalescent Heart Home have now been studied in detail by Dr. W. Sheldon, and one of them by Dr. W. R. F. Collis from the bacteriological point of view. Their papers published in this issue show that here, too, there was a latent period between the original infection and the relapse, and the figures, with those of Schlesinger, indicate that while tonsillectomy may give some protection against upper respiratory infection, rheumatic relapses are relatively commoner in children whose tonsils have been removed. Sheldon did not find aspirin an adequate prophylactic against relapses, and points out that these may occur while the temperature is normal.

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[3] Brit. Jour. Ophth., 1930, xi., 621.

[4] Ibid., Feb., 1931, p. 102.

[5] Ophthalmoscope, 1911, p. 470; Med. Annual, 1913, p. 254.

[1] THE LANCET, 1930, i., 499.

[2] Arch. Dis. in Childhood, 1930, v., 111.

The bacteriological findings are more controversial. Since the classical work of F. J. Poynton and A. Payne in 1900–04, many investigators have described organisms which they have held responsible for the manifestations of rheumatism and which have sometimes given a high proportion of positive skin tests in rheumatic subjects. Usually the organisms have been streptococci, and attention has mostly been focused on those of the non-hæmolytic group. But there is little similarity between many of the strains described, and arthritic lesions have been produced in rabbits by streptococci unrelated to rheumatism. Many authors on the other hand have found no one type of streptococcus consistently present in cases they have examined, and R. A. Macdonald,[3] reporting recently on a series of tonsils removed at operation, said he found it impossible to distinguish between the cultures from those removed from rheumatic children and those from the controls. In the epidemic at the Cheyne Hospital, Collis has isolated hæmolytic streptococci from the throats of patients in whom relapses occurred and has carried out skin tests with a soluble endotoxin and an exotoxin prepared from this organism. He finds rheumatic subjects highly sensitive to the former except during fulminating carditis. Control tests showed a high proportion of negative results. Further investigations on these lines will be awaited with interest, but at present the number of cases studied is small.

LOW BACK PAIN.

PAINS and disabilities centring in the lower back are often exceptionally difficult to diagnose and treat. At a lecture-demonstration at the British Red Cross Clinic for rheumatism on Tuesday, Dr. C. B. Heald classified the chief causes of low back pain into four groups: the "injury" group; the "constitutional disease" group (e.g., rheumatism, arthritis, gout); the "toxic" group, where the cause is constipation, appendicitis, or gonorrhœa; and the "congenital defect" group, where the pain springs from some anatomical abnormality, especially in a vertebra. Each of these groups has roughly its own diagnostic language, though of course most cases are to a certain extent mixed, but the clinician is often able to form fairly sound suspicions of the ætiology from a consideration of the physical type of the patient. According to Dr. Heald, patients can be divided broadly into the long-backed, the florid, the asthenic, and the healthy normal types. The possessors of long backs are, he says, especially liable to pure trauma, for they are working against an especially unfavourable leverage. Patients with a florid stout appearance should suggest arthritis or gout as the chief enemy. The toxic group of low back disabilities is chiefly made up of patients of the asthenic type, who show lordosis and kyphosis. The congenital defect is elusive, and its diagnosis depends largely on the elimination of other causes and an X ray.

Dr. Heald demonstrated tests of value in diagnosis and in the control of treatment. Mennell's test determines any inflammation or irritation of the roots of the sciatic nerve; the psoas and sacro-iliac joint are tested by the leg-lifting test, compression and separation of the iliac crests, arching the back in the prone position, and passive hyperextension of the hip-joints. Specific injury, if it does not fracture a transverse process, mostly tears fibres in the common aponeurosis or the ilio-lumbar ligament, and the patient will be able to lift one leg but not both when separated. Mennell's test will often find out the "constitutional disease" type, in which the arthritic or rheumatic lumbar spine irritates the sciatic nerves, while the patient will lift both legs and submit to having the iliac crests firmly handled. Moreover, he cannot stand hyperextension of the hips. Patients in the toxic group are also likely to show a positive Mennell's test on the painful side from sciatic involvement, and a slackness of the common aponeurosis which hinders leg-lifting. Their sacro-iliac joints are tender from loss of tone rather than acutely painful from definite injury. Trunk-lifting generally leads to dismal failure through rapid muscular fatigue, and hyperextension of the hips may be painful but full or excessive. The congenital-defect patient, whose defect is unmixed with other causes, may pass all the tests.

In discussing treatment, Dr. Heald laid stress on the value of extensive lumbar strapping for aponeurotic tear. He showed a patient in whom this method had relieved serious pain of ten years' standing, and in whom it had been replaced by a celastoid belt for permanent wear. The constitutional disease type, he said, benefits from physiotherapeutics and exercises, and its lordosis should be given special attention. The badly toxic patient should be immobilised as for a fracture until the muscles can be restored by rest, regulation, and the removal of foci. The congenital defect can sometimes be removed by operation, but is only too apt to cause further trouble.

JESSE BOOT OF NOTTINGHAM.

Lord Trent, who died in Jersey last Saturday, will be chiefly remembered as a Freeman of Nottingham who earned vast wealth and put it to worthy ends. Grandson of an agricultural labourer and son of a herbalist, he was born 81 years ago in Nottingham, and at the age of 13 took control of his father's shop in Goose Gate. Spending his spare time in studying pharmacy he opened 14 years later a chemist's shop in a working-class neighbourhood of Nottingham, which was the forerunner of a retail chemists' undertaking employing 13,000 people. Under his direction the firm of Boots soon began to manufacture their own drugs and were in the position to supply to the troops during the war a hundred millions or more of water-sterilising tablets, while Sir Jesse himself in collaboration with Colonel E. F. Harrison devised the box respirator for which the firm supplied all the chemicals required. On his native city Sir Jesse spent nearly a million pounds, his greatest gift being the new University College at Highfields in which he endowed several scientific chairs. His wife and he also built hostels for students on a lavish scale. To ensure a noble appearance for the East Midland university, which he saw in imagination, he laid out a broad street a mile long bordered with rhododendrons to be named the University Boulevard. His benefactions in his wife's home of Jersey to which he retired were of similar intent and on a like scale. He initiated a scheme for coöperative marketing by Jersey farmers and built schools and workmen's houses. This achievement is the more remarkable when it is remembered that for 30 years he had been completely crippled by myositis ossificans.

ON June 8th Surgeon Rear-Admiral Reginald Bond was received by the King upon his appointment as Medical Director-General of the Navy from July 1st.

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[3] Ibid., p. 60.

SPECIAL ARTICLES

HARVEIAN SOCIETY CENTENARY.

LAST week the Harveian Society of London celebrated the conclusion of its hundredth session by recalling scenes in William Harvey's life and assembling many of those who honour his memory. The celebration opened with the delivery of an oration, published in our columns last week, by Dr. Raymond Crawfurd, on the place of medical societies in the progress of medicine.

EXHIBITION OF RELICS.

Members of the society were entertained to tea on Thursday in the Great Hall of Harvey's hospital, where an attempt had been made to arrange an exhibition of Harveian relics. It must be admitted, however, that in spite of Harvey's long association with St. Bartholomew's practically nothing has survived which can be regarded as having a personal connexion with Harvey himself. The nearest approach is the fine pewter inkstand, given to the hospital by Martin Bond in 1619. This almost certainly was used by Harvey when he attended at the hospital, and it still stands on the table in the Treasurer's office, though a replica has been made for his use. The other treasures in the exhibition dated from the earliest days of the hospital down to the end of the seventeenth century. They included a deed making a grant by Rahere to Hagno in 1137; a deed of covenant signed by Henry VIII. in 1546; and the well-known Cartulary of John Cok, 1456–68. Other manuscripts were the volumes of the hospital ledgers and journals covering Harvey's time, and another of definite Harveian interest was the repertory book, with the plan of the hospital as it was in 1617. Harvey never actually lived in the hospital, but this plan was made during the period of his service, his appointment as physician to the hospital dating from 1609. The hospital silver was also exhibited, the earliest piece, a tall cup with a baluster stem, having been given by "John Jones, Cittizen and Marchant Taylor of London." in 1639. In addition to these relics there were shown reproductions of all the known portraits and busts of Harvey, and an almost complete range of the editions of his three books: *De Motu Cordis, De Circulatione Sanguinis, De Generatione Animalium.* A few of these were from the St. Bartholomew's College library, but the first edition (1628) of *De Motu Cordis* was lent by the Royal College of Physicians of London, together with the editions of 1639 and 1643. The Royal College also lent the two editions of the *De Venarum Ostiolis* by Fabricius published in 1603 and 1624, the plates in which were the source of the famous engraving in Harvey's work. The first edition of *De Circulatione Sanguinis* was lent by the Royal College of Surgeons, together with the first English translation of *De Generatione* (1653), a copy on fine paper with the engraving by Faithorne. Another fine example of this engraving was lent by Sir D'Arcy Power. It is regarded as probably being the best representation of Harvey in existence. Another book of extraordinary interest was the copy of the first edition of *De Generatione Animalium,* containing notes upon Aristotle in Harvey's own hand on the fly-leaves. This had afterwards belonged to Harvey's brother Eliab, and contains his signature. It was lent to the exhibition by Mr. F. C. Pybus, of Newcastle. Other examples of Harvey's crabbed and difficult handwriting were two brief signed notes. One of these belongs to the hospital; the other was lent by the Wellcome Medical Historical Museum, together with a number of paintings and other objects of interest. Among the books were some very uncommon editions, notably those of *De Motu Cordis,* published at Padua in 1689, and at Bologna in 1697, of each of which only one other copy has been recorded.

BUCKSTON BROWNE DINNER.

A festival dinner was held at the Grocers' Hall on Friday evening when Prince Arthur of Connaught was the principal guest. Sir Thomas Horder, president of the society, who was in the chair, announced the election of Prince Arthur to honorary membership of the society, handing him a gold medal specially struck to commemorate its centenary.

Prince Arthur, in proposing "The Society," spoke of its endeavour to maintain the spirit of Harvey. As chairman of the Middlesex Hospital he was, he said, deeply interested in all that related to the progress of medicine, and he regarded societies like the Harveian as assisting greatly in the expansion of medical science and the development of medical services.

Sir Thomas Horder, in reply, greeted Prince Arthur as a Freeman of the Worshipful Company of Grocers, in whose beautiful hall the feast was being held. Although William Harvey was not a Grocer himself, three of his six merchant brothers belonged to the Company, an association which had no doubt influenced the Master and Wardens in their decision to offer hospitality on this occasion. The Harveian Society, he said, had not departed from the spirit of its eponym. In its presidential chair had sat physicians like Richard Quain, William Broadbent, Hughlings Jackson, Thomas Buzzard, John Williams, James Goodhart, and Malcolm Morris; surgeons like John Erichsen, Henry Thompson, Thomas Bryant, Watson Cheyne, C. B. Lockwood, Henry Power, and his equally distinguished son D'Arcy Power. Harveian lecturers such as Jonathan Hutchinson, Francis Champneys, Buckston Browne, Almroth Wright, StClair Thomson, Arthur Keith, and Berkeley Moynihan had made evident the society's efforts to search out the secrets of nature. It was, he said, difficult for us to speak of William Harvey in moderate language. He was so easily the central figure in our annals and the founder of scientific medicine in this country. As Cæsar appeared to Cassius in relation to the Roman republic, so Harvey appeared to us in relation to British medicine—"He doth bestride the narrow world like a Colossus; and we petty men walk under his huge legs, and peep about to find ourselves dishonourable graves." Harvey had done a much greater thing for medicine than to establish beyond all doubt the physiological principles governing the circulation of the blood. He introduced rational and scientific methods into the chaos of empiricism, speculation, and wild hypothesis. Imagination boggled at the thought of what medicine was before Harvey. A friend of his, speaking of to-night's engagement, had said "Harvey? that was the man who discovered the circulation of the blood, wasn't it?" adding, after a pause, "I think they really must have known about it before." A few days ago, Sir Thomas went on, he had joined in a search for those caves in the garden at Coombe Lodge, Croydon, where, said Aubrey, Harvey was wont to sit and meditate. He did not find them, but was able, nevertheless, to capture something of the Harvey atmosphere in the old garden where Dr. George Ent had sought out Harvey and induced him reluctantly to part with his book *De Generatio Animalium*. He concluded by thanking Prince Arthur for his good wishes and assuring him that the society would strive to justify the distinction which his name had given to its roll.

Sir StClair Thomson, as an honorary member and one of nearly 40 years' standing, bade the guests welcome. He quoted a saying about Sir Astley Cooper that he had passed "through the hearts of the poor into the pockets of the rich," adapting it to apply to Prince Arthur who, as treasurer of the Middlesex, had passed "through the pockets of the rich into the hearts of the poor." Prof. W. H. Welch replied for the Harveian Society of New York as one who occupied the chair of medical history at Harvard. "Permit me to say," he kindly remarked, "you do these things extremely well." He described the effect of anniversary celebrations of this kind in stimulating the advancement of medical knowledge. Lord Dawson, who also replied, spoke with feeling of the ties of medical comradeship. In no other field, he said, do we work in such harmony. Dr. D. Elliot Dickson, representing the Harveian Society of Edinburgh, was induced to tell a story.

The guests included Dr. R. A. Young (President of the Medical Society of London), Dr. Raymond Crawfurd, the Archdeacon of London, Sir Farquhar Buzzard, the Master of the Apothecaries, Prof. W. Blair Bell (President of the British College of Obstetricians and Gynæcologists), Sir Arthur Gaskell, the Master of Caius College, Sir Dudley Ridout, and Dr. H. B. Brackenbury.

PILGRIMAGE TO HEMSTEAD.

The centenary celebrations ended auspiciously in a summer day's pilgrimage on Saturday to Hempstead Church where William Harvey and many of his family are buried "lapt in lead" in the Harvey Chapel. His remains were transferred in 1883 from the vault beneath the church, at the charge of the Royal College of Physicians. The journey was made by road and the party, which included a large number of ladies, was received by the vicar, the Rev. Conyers Barker, at the church where a short service was held, the address being given by the Right Rev. T. A. Chapman, D.D., Bishop of Colchester, and a collection was taken in aid of the fund for rehanging the bells when the new tower is built to replace the one that collapsed in 1882. Sir Thomas Horder then offered, on behalf of the Harveian Society, a silver paten, which was received and consecrated to the use of the church. The party inspected the Harvey relics contained in the church and its vault, and took luncheon in the vicarage garden. The members then proceeded to Rolls Park, Chigwell, near Loughton, where they were received by Lady Francis Lloyd, and Sir D'Arcy Power gave a short account of William Harvey in his family relationships.

CONTRIBUTORY SCHEMES AND PUBLIC ASSISTANCE. The Leeds public assistance committee has adopted a scheme for providing hospital treatment for the contributors to the Leeds workpeople's hospital fund and their dependants. A payment of twopence per week will entitle the beneficiaries to treatment at the hospitals of the public assistance committee or at the public dispensary and nursing societies of the city. The workpeople's fund will pay to the Leeds corporation £1 5*s*. for each in-patient within the city—tuberculous, mental, chronic, maternity, and notifiable diseases cases excluded. The full rate of maintenance and treatment will be paid for patients outside the city area.

ROYAL INSTITUTE OF PUBLIC HEALTH.

ANNUAL CONGRESS AT FRANKFORT-ON-MAINE.

THIS congress was held from May 19th to 24th. From Frankfort opportunity was taken to visit the spas of Nauheim, Homburg, Wiesbaden, Kreuznach, and Munster a. St., and on the outward journey most of the visitors called at Aachen to see the Quellenhof and the Landesbad with its baths for insured patients. The sessions of the congress were held in the lecture rooms at the Städtisches Krankenhaus, a hospital of some 3000 beds. Of the numerous papers read at the six sections only a few notes can be given here.

Section of State Medicine.

DIABETES.

Dr. G. SINGER (Vienna) said that the increase in the extent of diabetes and the peculiar difficulties of dealing with this disease have brought it within the sphere of public health activity in Vienna. The discrepancy between our considerable scientific knowledge of the disease and the results of treatment are most marked in the age-group 25–55, the most productive years of man's life. In Vienna a welfare centre has been set up confined to the very poor; it has been so successful that doctors are anxious to send both private and insured patients to the centre. In 1930 2000 patients attended; those requiring hospital treatment were recommended to go to hospital; the bulk were dealt with at the centre. The installation of special kitchens for diabetes is an important advance. Dr. Singer considers that many diabetics can be efficiently treated and more cheaply without insulin.

Dr. L. R. GROTE (Frankfort) pointed out that in the German public hospitals the number of patients admitted for diabetes had increased by 80 per cent. from 1924 to 1927; the increase is due to treatment by insulin and to the diminution of the mortality in children which can now be reduced to nil. The treatment of diabetics is usually extended over too long a period; they ought to be treated intensively either in a special clinic or in a special division of a hospital. In the Carl von Noorden Clinic at Frankfort, the severest cases are made fit for work in about 18 days. Subsequent treatment and advice could well be given at special welfare centres. Dr. Grote also advocated the institution of homes for diabetic children where they would be instructed on diet.

CANCER.

Herr GRUNEISEN, general secretary of the German Society for Combating Cancer, pointed out that owing to better methods of treatment in the last 20 years there had been a lessening of mortality from cancer during the middle period of life. For the diagnosis and treatment of cancer centres should be established in connexion with university clinics and the large hospitals. A concentration of all the cases of cancer in such centres is not desirable or necessary; the cost of the apparatus and the difficult X ray and radium technique, however, compel a certain amount of concentration. An important duty of the cancer centres would be the following up of all patients treated for at least five years. No effort must be spared to prevent sufferers being treated by quacks.

VENEREAL DISEASES.

Dr. ROESCHMANN, general secretary of the German Society for Combating Venereal Disease, gave an account of the working of the law relating to the prevention of venereal disease passed by the Reichstag in 1927. This requires that anyone knowingly suffering from venereal disease or having reasonable cause to believe themselves to be infected must submit themselves to medical treatment by a qualified medical practitioner. Parents and guardians must similarly see that children under their care so suffering are treated. The competent sanitary authority may require persons whom they have reason to believe are suffering from and disseminating venereal disease to produce a medical certificate as to their health. Persons suffering from and suspected of disseminating venereal disease may be subjected to curative treatment and may be detained in a hospital if such detention appears to be necessary to check the spread of the disease. Medical treatment involving serious danger to life shall only be undertaken with the consent of the patient. Any person cohabiting while knowingly suffering from contagious venereal disease or having reasonable cause to believe himself infected shall be liable to imprisonment; a similar penalty can be enforced if any such person marries without informing the other party to the marriage of such infection. Only qualified medical practitioners may treat venereal diseases and diseases of the genital organs; the treatment given must be more or less orthodox. This section also requires examination of the patient by the doctor; there must be no treatment by correspondence (absentee treatment). The giving of advice by lectures and so forth on self-treatment is also prohibited. Anyone who medically examines or treats a patient with venereal disease must inform him of the nature of the disease and the danger of spread and give him a copy of the official memorandum on the danger of venereal disease. Any patient under observation or treatment who fails to attend or who in consequence of his occupation or other circumstances is especially dangerous to other persons must be notified by the doctor in attendance to the sanitary authority. Secrecy is ensured by the infliction of a legal penalty on any employee of a sanitary authority or venereal disease centre who discloses information acquired in the course of his duty as to the existence of venereal disease in any person or its source. Such disclosure may, however, be made by a medical practitioner in the service of the sanitary authority or venereal disease centre or with the consent of such medical practitioner to a public authority or to any person who is entitled to such information in the interests of his own health. The advertising or recommending to the laity of any drugs or treatment for venereal diseases is forbidden under a penalty. The Government may test drugs intended for use as preventives of venereal disease and, if necessary, may stop their sale. Regulations may also be made as to the display, advertising, and recommendation of any approved drug. The law also deals with the prevention of spread to or by babies and children.

In the course of discussion Dr. Roeschmann said that in Germany brothels were being gradually closed. He thought that accosting could be controlled by the police; this had been effected in Hamburg where, shortly after the war, it became so intolerable that the public complained, also in Carlsruhe where the Minister concerned had investigated the matter personally and ordered the police to take action.

CRIMINAL ABORTION.

Dr. V. BORLAND and Councillor BENNETT (Bethnal Green) in a joint paper stated that the traffic in "female remedies" is very considerable; practically every pharmaceutical chemist stocked one or other of these preparations as a regular line: they were even more prominently displayed by the herbalist and "hygienic store." An ergotin and aloes compound pill sold virtually to secure abortion could be freely obtained from any wholesale patent medicine house; the cost was high—*2s. 6d.*, *3s. 6d.*, or even more a box. "Orange pills," in regular demand in the East End of London, were sold by unqualified drug stores at 1*s.* for six pills; they contained aloes, liquorice, and colocynth, and are no more than a strong laxative. These fraudulent preparations are sold to women who are in a state of the direst poverty. During 1930 66 cases of abortion occurred in Bethnal Green: five of the women died. Nineteen deaths from childbirth occurred in the last two years, seven of these being due to septicæmia following abortion. The taking of pills and drugs was definitely ascertained in two cases; in three other cases there was reason to suspect instrumental interference.

SCOLIOSIS.

Mr. G. R. GIRDLESTONE (Oxford), in an account of the English orthopædic schemes, referred to the insidiousness of scoliosis which when once established cannot be completely cured and which is often progressive throughout childhood and again after middle life, yet no parent is prepared to take a child to a distant hospital even once for a defect which is so intangible until well established; only when there is an orthopædic clinic nearby with its consequent automatic instruction of the mothers in the vicinity will such defects, easily cured in their early stages by remedial exercises, be prevented.

DISINFECTION.

Dr. ROSENHAUPT (Mainz) regretted that the disinfestation of dwellings by hydrocyanic gas liberated from zyklon was not allowed in Germany; its use is permitted in Scandinavia, Austria, and Hungary. In Germany, however, zyklon may be used for premises other than occupied dwellings. He described a hydrocyanic gas chamber which can be charged and emptied without anyone having to enter it. For the disinfestation of dwellings he recommended the use of diametan, a mixture of sulphur with an oxidising agent; this liberates sulphur trioxide at high pressure.

Section of Industrial Hygiene.

ENGINEERING RISKS.

Dr. A. MASSEY (Coventry), dealing with the health of workers in the engineering industry, said that some 50,000 persons in the city of Coventry were engaged in the engineering trades. The health of workers in an industry depends not a little on the health of the industry itself; good trade means regular employment, decent earnings, and relief from mental anxiety attendant upon economic stress. Home conditions are of basic importance; it is very little use to work in a hygienic factory if the worker has to live in a slum. Many engineering processes tend to eliminate the physical misfits at an early stage; at a later stage there is also a selective transfer from engineering to other vocations when advancing age finds engineering too exacting; the proportion of workers over 50 years of age in this trade is considerably less than that of workers in all occupations collectively. In engineering shops heat is often a detrimental factor; this has to be countered by the cooling powers of adequate ventilation. The dangers to health from sand-blasting, the process used for cleaning the surfaces of castings and heat-treated machine details by impinging sand under high pressure, are somewhat difficult to counter. Some of the fine particles of silica penetrate the fabric of the helmet or gain access under the cape attachment; although the *maintenance* of a positive air pressure inside the helmet is of service, the use of shot instead of sand should be considered; the shot do not fracture or become pulverised. Even then the danger from silica is not entirely removed: the rough castings before treatment are coated with sand burnt on during the moulding; shot-blasting breaks off these particles producing a fine silica dust which must be guarded against. Respirators are unfortunately not ordinarily employed during the sieving of used mould sand. Chromium plating has been increasingly used of late to render bright motor-car and cycle fittings untarnishable. The worker is very apt to inhale chromic acid fumes; the respirators supplied are often only used when the men are under direct supervision. In cellulose spraying the emanations in the spraying chamber and its immediate vicinity are very pungent; they contain certain benzene derivatives which are occasionally the source of benzene poisoning and at times include amyl nitrite as a decomposition product; the inhalation of this substance may conceivably bring about cardiovascular changes. Oil dermatitis and boils cause much trouble among operators of turret and automatic machines; for cooling these during metal-cutting operations large quantities of a special expensive oil are used. It is used over and over again and soon swarms with micro-organisms especially streptococci; other impurities and metallic particles are present. The addition of a bactericidal fluid miscible with oil serves to prevent boils, but oil dermatitis caused by the action of the metallic particles and other impurities continues to be not uncommon.

Dr. H. L. Garson (Port Sunlight) set out his nine years' experience of the medical examination of employees at a food factory employing some 500 workpeople. The employees are examined before being accepted for work; in order to be certain of excluding workers with septic cuts or sores on the hands and arms it is made a condition of employment that the employees shall submit to re-examination if so required. Of 475 girls examined between the ages of 14 and 18, 54 were rejected; 49 of these owing to lack of personal cleanliness, but only 5 on account of physical defect. Any defects found in those passed as fit for work are noted and treatment secured: girls under 18 who have dental caries or a defect of vision must submit to treatment. Smaller employers by combining among themselves could do much to reduce the cost of medical treatment, some of which can be given under the panel system. In answer to a question Dr. Garson stated that during nine years' work in the food factory he had not come across a single case of enteric fever or dysentery among the employees.

MOUNTAIN SICKNESS.

Prof. Koelsch (Munich) addressed visitors to mountainous resorts. He considers that when climbing mountains, possibly carrying a load—in other words, a rücksack—persons especially sensitive may be attacked by mountain sickness even at a height of 1000 to 2000 metres. When the ascent is passive—i.e., riding a horse or mule or by mountain railway—the critical altitude is about 3000 metres. The rapidity with which height is attained comes into play; the longer the time taken the longer have the body mechanisms to accommodate themselves to the altered conditions. The Austrian Zugspitze railway takes only 20 minutes to ascend about 1900 metres, whereas the Bavarian electric railway requires an hour to reach the same altitude. The authorities of mountain railways going up to great heights should be required to put up a notice at the starting station giving advice to elderly and delicate persons, especially to invalids with heart or lung complaints or with high blood pressure, marked anæmia, and possibly ear troubles. Notices should also be posted in the carriages and at the various stations advising passengers, especially elderly and delicate persons, on alighting to rest in order to become acclimatised. It is also advisable that the rate of ascent should be fixed at 20–30 mins. per 1000 metres difference in altitude. An acclimatisation station between the second and third part of the journey would be useful; persons feeling discomfort on the way up could alight in time.

EXHAUST GASES.

Prof. Gross (Ludwigshafen) did his best to dispel any fear of the danger of exhaust gases from motor traffic in streets. He found that when the engines are running at full speed the exhaust gases contain only a small percentage of carbon monoxide, 0·1 per cent. by volume as opposed to 6·8 per cent. when running light; similarly unburnt motor spirit is much more abundant when the engine is running light. But much dilution of the exhaust gases occurs even at a distance of one metre from the car; with increase of the velocity of the motor-car further dilution takes place. In a car standing still there was 3 per cent. of carbon monoxide in the exhaust and less than 0·1 per cent. at a distance of a metre. Travelling at the rate of 10 kilometres an hour there was 6·5 per cent. of carbon monoxide in the exhaust and less than 0·1 per cent. at a distance of one metre; when the speed was increased to 20 kilometres there was 9·6 per cent. of carbon monoxide in the exhaust and less than 0·1 per cent. at the distance of one metre. No danger is to be apprehended from the air in well-ventilated tunnels; in the tunnel under the Elbe at Hamburg, which is provided with adequate natural ventilation, the percentage of carbon monoxide was found to vary from 0·005 to 0·023. The results of 101 analyses of air collected in streets mostly during rush hours under varying conditions of temperature and meteorological conditions at the level of the head of a policeman on six occasions only gave a percentage exceeding 0·015, the highest being 0·023; the air examined at the same spot a few minutes later contained far less carbon monoxide. Seeing that danger only arises from breathing 0·02 per cent. of the gas for several hours even persons stationed on duty in streets run no danger of carbon monoxide poisoning. There is also no danger from unburnt motor spirit in the exhaust gases liberated in the streets; experiments on animals showed that 10 to 15 times the amount present in exhaust gases must be reached before such unburnt spirit could cause trouble.

Section of Women and Children.

Prof. Grotjahn (Berlin) pointed out that in the last decade the birth-rate has fallen to 16 per 1000 in England and 18 in Germany; half of what it has been. Unless steps are taken the birth-rate will fall further. States which depend on commerce and industry require a certain density of population and must guard against dwindling. A diminution must occur if families are to consist of two children only; for maintenance of the number each family must have on the average three children, and as this will not occur in each individual family it is essential for the State that there should be many families with more than three children. Dr. Grotjahn considers that the time has come for an appeal to parents to beget children; the burden should be adjusted by making family allowances to those drawing regular wages and by compulsory insurance for parenthood for others.

Prof. E. Schlesinger (Frankfort) said that during the last few months a retrogression had occurred in the state of nutrition of the children of the working classes. Too little milk and milk foods were consumed and in the winter months too little vegetables; the cheaper kinds of meat and sausages were being used. Very valuable is the milk breakfast with its 260 calories and the dinner with its 500-600 calories and abundant vegetables provided by the schools.

Section of Tuberculosis.

THE GERSON DIET.

Discussion on the influence of diet on tuberculosis was stimulated by the presence of Dr. Gerson, one of the originators of the salt-free diet. Opinion among those present was, on the whole, averse to its use—at least, for cases of pulmonary tuberculosis. Dr. G. Schröder (Schömberg) considered such a diet dangerous to some patients. Dr. O. Amrein (Arosa) held that patients treated for tuberculosis could not all be given the same diet; differences in national dietaries stood in the way. Although he had seen astonishing results obtained by Prof. Sauerbruch at Munich in cases of surgical tuberculosis, and especially in patients with lupus given a salt-free diet, he had given it up himself in pulmonary tuberculosis. Prof. L. Brauer (Hamburg) had caused consecutive patients admitted to his institution to be sent alternately to one pavilion when they were given salt-free diet, and to another when they were given the ordinary full diet; no difference could be detected in the results. Prof. F. Volhard (Frankfort) explained that in the treatment of pulmonary tuberculosis by a salt-free diet Gerson holds that the diet should be largely vegetarian with but little meat, and the body should be saturated with vitamins, whereas Herrmannsdorfer allows food rich in protein and not so restricted as to meat. Both have prescribed a so-called "Mineralogen," a mixture of calcium salts and phosphorus with cod-liver oil; this is, however, apparently no longer considered an essential part of the treatment. Common to both diets is the increasing restriction of sodium chloride. Although he had found no benefit to tuberculous patients by giving them a salt-free diet he was certain that such a diet was of benefit to patients suffering from other diseases. The salt in the food should be limited so that the chloride excretion in 24 hours does not exceed 1 g. The kidneys are saved work, the quantity of circulating blood is lessened; blood pressure often falls, and attacks of angina pectoris cease.

EARLY SIGNS.

Dr. J. Strasburger (Frankfort) reported that examinations of contacts with tuberculous patients carried out at the University polyclinic at Frankfort, in which X rays had been largely employed, showed that in 2·6 per cent. there was a manifest lesion of the lungs. All these contacts were apparently healthy and would not have sought medical advice. Control examinations of about 1400 students and nurses resulted in the discovery of only one case of tuberculosis. The form taken by the disease in the contacts was the *Früh-infiltrat*, which usually can only be detected by X ray examination.

Dr. J. Rennie (Sheffield) emphasised the importance of dealing with cases of pulmonary tuberculosis before they became sputum-positive. In Birmingham, London, and Sheffield a rough comparison of the percentage of sputum-negative cases treated in sanatoriums is 30·3, 20·5, and 81·7 respectively; these figures indicate that in Sheffield for every infectious case of pulmonary tuberculosis treated in sanatorium four non-infectious cases are so treated. The position to-day is that no physician can guarantee a complete cure to an infectious case of pulmonary tuberculosis however localised the initial lesions may be. Of 7231 sputum-positive cases recorded in Sheffield since 1911, 80·4 per cent. have died of pulmonary tuberculosis; 2 per cent. have died of other causes. In no area can the death-rate be appreciably lowered by curing infectious cases of pulmonary tuberculosis; to effect this it is necessary to diagnose and treat the disease before the sputum-positive stage. He holds that where definite infiltration is shown by radiographic examination physical signs are present. Whether such patients are in the active stage of the disease or not can only be determined by admitting them for observation.

COLLIERS AND SILICOSIS.

Prof. S. Lyle Cummins (Cardiff), speaking on coal-miners and tuberculosis, said that coal-miners, although so constantly exposed to the inhalation of both coal dust and stone dust, are notoriously less liable to pulmonary tuberculosis than the rest of the adult male population in Great Britain. There is, however, a high death-rate of colliers from bronchitis. A large proportion of elderly coal-miners are affected with a degree of silicosis which though not sufficient to prevent them from working is sufficiently advanced to give rise to the radiological appearances characteristic of lung fibrosis; such men tend to be short of breath on exertion and are liable to have a cough and bring up rather copious sputum, often black in colour; they are also subject to fairly frequent attacks of catarrh. Apart from the stone dust used to prevent explosions there is also present in the air of coal-mines stone dust from the ripping of the roof, the repairing of the walls and road, and from the coal face when the seam has to be reached by drilling "hard headings." Prof. Cummins believes that fine particles of silica are taken up by alveolar phagocytes and carried into the intercellular spaces of the alveolar walls. Thence the dust-laden cells enter the lymphatic vessels; the silica particles undergo slow solution and the silica sol thus produced causes a fibrosis to be set up. The dust cells agglutinate in the lymph channels obstructing the circulation, ultimately causing local stasis; around these accumulations of cells fibrosis also occurs. The presence of coal dust in the lungs of experimental animals has been found to have a definite protective effect against tuberculosis; its anti-tuberculous properties may depend upon its well-known powers as an adsorptive agent.

MEDICINE AND THE LAW.

Coöperative Drug-supply: Unsuccessful Action against the Minister of Health.

The difficulty of obtaining any remedy against a Minister of the Crown was shown last month by an unsuccessful action against the Minister of Health. The third schedule of the Medical Benefit Regulations governs the supply of drugs and appliances under the national health insurance system; its provisions are part of the terms of service agreed a few years ago with representatives of the pharmacists. If the Attorney-General is correctly reported, he stated that "it was understood or agreed that the terms should apply for a period of six years." In the schedule it is stipulated that no chemist shall give or offer to any person any gift or reward "whether by way of a share of or dividend on the profits of the business or by way of discount or rebate or otherwise" as an inducement towards, or in consideration of, such person presenting an order for drugs or appliances on a prescription form under the regulations. It is easy to imagine the kind of abuse at which the stipulation was aimed. But the result was to make a coöperative society unable to pay dividends on health insurance prescriptions dispensed in coöperative drug stores. The societies not being entirely devoid of influence, the Minister of Health proposed to cancel the obnoxious stipulation. The proposed change affected the prospects of some 10,000 retail pharmacists throughout the country who objected to the deletion. They applied to the Chancery Division for a declaration that the Minister was not entitled thus to alter the terms of their contracts with the insurance committees, and for an injunction to restrain him from carrying out his intention. The Minister, of course, has large powers of making and altering regulations under the National Health Insurance Acts, but the plaintiffs argued that his present proposal was not a bona-fide exercise of such powers. Appearing on behalf of the Minister, the Attorney-General contended that the plaintiffs' action was misconceived, that it disclosed no consideration for the alleged agreement, and that the bargain was legally invalid. He applied to strike out the claim on the ground that it did not disclose any reasonable cause of action; the proper remedy, if any, was by way of petition of right. The court agreed; it would be a waste of time and money for the plaintiffs to continue their action in the present form; the action was therefore dismissed with costs.

The Crown is notoriously a well-equipped and relentless opponent. The almost archaic procedure by petition of right, which the Pharmacists' Union has now been told is its only method of attack, is something of a scandal. It is slow and costly. The legal advisers of the Crown can hamper the petitioners at every turn. The petition cannot be set down for trial until it obtains the "fiat" of the Crown ("that right be done"); the granting of the "fiat" is an act of grace. In several ways the rights of an ordinary plaintiff disappear when the Crown is defendant. The Crown can obtain discovery of documents in support of its case; the petitioner has no such right against the Crown. In other respects (counter-claim, pleading, and amendment) the Crown enjoys technical privileges which have long ceased to exist as between ordinary litigants. The unfairness of the procedure against government departments was fully illustrated in the years following the termination of the war. The experience led to the setting up of a Crown Proceedings Committee; but there were unaccountable delays in its deliberations, and ultimately Lord Haldane bade it formulate legislation on the express assumption that reform was essential. Some years after the committee was set up it produced a well-drafted bill to make sweeping changes. The ancient principle that the King could do no wrong (originally, perhaps, based on the difficulty of suing the King in his own courts) was to be abolished, as has already been done in the Dominions overseas. The Crown could then be sued in damages if the servants of the Crown were guilty of negligence or other misconduct. Nothing, however, has been done to carry out the committee's proposals, though both branches of the legal profession have publicly demanded that this reproach to English justice should be removed. At least one eminent judicial authority has attacked the evils of bureaucracy. Here is an evil with the cure ready to hand. The law is amply represented in both Houses of Parliament. Its representatives would serve their country well by pressing for the consideration of the Crown Proceedings Bill. If, as in the present instance the retail pharmacists have no valid legal grievance against the Minister, it should be possible to establish the fact without recourse to procedure which expert opinion condemns as unfair.

THE SCOTTISH CENSUS OF 1931.

(FROM OUR EDINBURGH CORRESPONDENT.)

IN answer to a question in the House the Secretary of State for Scotland has issued the provisional summaries of the recent Scottish census. The population of Scotland shows a fall from 4,882,497 in 1921 to 4,842,554 in 1931; a decline of 39,943, or 0·8 per cent. At the last census the increase of population was trifling, and the present decrease is hardly a surprise. The causes cannot be fully analysed until the detailed returns appear, but at least some of the causes are easily guessed. The census of 1921 had, on account of the coal strike of that year, to be taken in June instead of in April. This affected the local populations and made some confusion for the administrative bodies, especially those of the small summer holiday resorts; but this could not touch seriously the total for Scotland. Two main causes of the decline are suggested: the drift of industry southwards to England, a theory that cannot be verified until the English figures are ready, and the falling birth-rate, which is true of Scotland as of England. Emigration was mounting in the early days of the decade, but it has recently fallen materially. This should count towards an increase of the population, and yet the population has fallen.

TOWNS AND RURAL AREAS.

The 24 towns over 20,000 at last census show a net increase of 65,810; 15 of them show an increase of 84,818, but 9 of them (coal, iron, and shipping) show a decrease of 18,908. Glasgow has increased by 36,890, or 3·5 per cent., now standing at 1,088,417; Edinburgh by 18,734, or 4·5 per cent., now standing at 438,998. The two cities of Dundee and Aberdeen show increases of 7268, or 4·3 per cent., and 8298, or 5·2 per cent. respectively.

Of the rural areas, some show very serious decreases. Argyllshire declined from 78,862 to 63,014, or 18 per cent., but this was, at least in part due to the "holiday" factor. Bute, another "holiday" area, fell from 33,711 to 18,822, or 44 per cent. In both these extreme cases, however, there was probably a more fundamental drift from the "land" to the town. Caithness, an agricultural and fishing county, fell by 2629, or 9·3 per cent. Ross and Cromarty, which includes the island of Lewis, fell by 8016, or 11·3 per cent. This is almost entirely an agricultural, fishing, and sheep county. The biggest decline in a purely rural county, except Argyll, is shown in Wigtownshire, which fell by 1484, or 4·8 per cent. Of the northern island groups, the county of Orkney shows a decline of 2036, or 8·4 per cent., and Shetland, 4110, or 16·1 per cent. The populations of these two are now 22,075 and 21,410 respectively.

As to sex, males declined from 2,347,642 in 1921 to 2,325,867, a fall of 21,775; females, from 2,534,855 to 2,516,687, a fall of 18,168. In 1921 the excess of females was 187,213; it is now 190,820. It will be interesting to see how the transfer of industry affects men and women and whether the decline in the birth-rate is due, in any material proportion, to a decline in the marriage-rate.

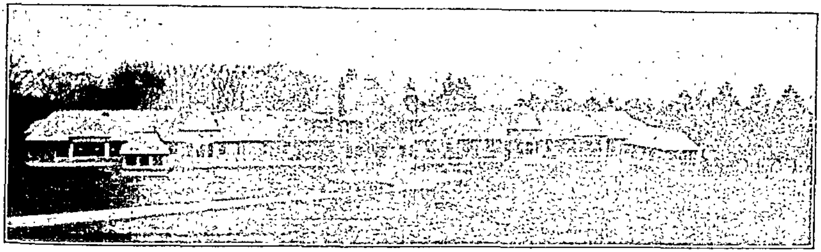
EFFECTS OF DEPRESSION IN INDUSTRY.

In no previous census have the effects of industrial depression been so manifest, whether we look to Shetland, in the extreme north, or to the industrial belt of the midlands, which holds about three-fourths of the Scottish population, or to the agricultural areas of marginal counties of the highlands and lowlands. But the analysis of these redistributions, which are so obvious in a small nation like Scotland, must await the completed returns and then we shall be enabled to judge whether a trifling decrease of 40,000 in some four and three-quarter millions is any indication of vital decadence or only represents a passing phase of industry.

GILGAL HOSPITAL, PERTH.

THIS hospital has been designed and erected by the directors of James Murray's Royal Asylum, Perth, to meet a special need. It became apparent during recent years that more accommodation of the hospital type for acute and recent cases and those requiring medical and nursing treatment was required, and after consideration of the various possible means of expansion it was decided to erect a self-contained hospital block of 40 beds on an adjacent site. This building is intended to be reserved solely for voluntary patients and especially for those whose standard of behaviour and habits is high, whose malady is slight or of short duration, who are sensitive and fully appreciative of their surroundings and company, and who may be apprehensive of possibly harmful or painful contacts with invalids of a more confirmed or different type.

The property named Gilgal, on which the new



View of the hospital.

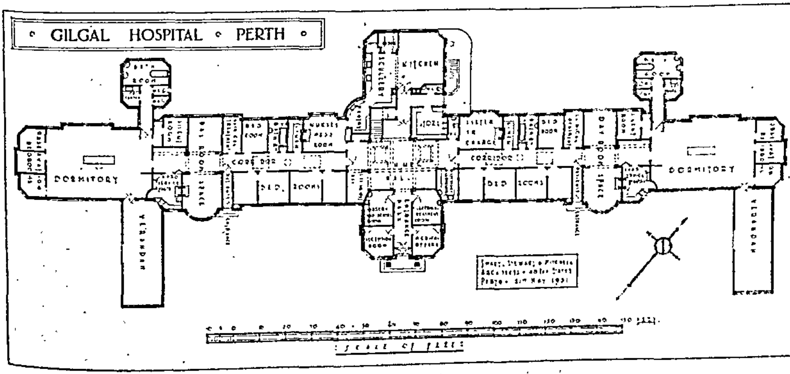
hospital has been built, extends to about ten acres. It is situated on the slopes of Kinnoull Hill about 200 feet above sea level, and is about one mile from Perth, on the east side of the river. The private rooms, verandahs, and garden face south and west, and it commands to the north a magnificent view of the valley of the Tay and the mountains beyond.

The hospital consists of two wards and a central admission block. The latter contains on the ground floor a medical office, reception room, surgery and dental room, electrical treatment room, dispensary and laboratory, and office of matron, all connecting with the main entrance hall. At the back are the kitchen and store, nurses' mess room, and service pantry. On the first floor of the central block are the staff quarters, including detached rooms for night nurses and in the basement, with access only from outside, is the central heating and domestic hot water plant. Under the entrance hall is the meter room and a compartment for luggage. The surgery and dental room is fitted for minor surgery, surgical examinations, and for dental treatment. It contains a gas-fed sterilizer, wash-hand basins and sinks, a dental chair, and instruments for emergency surgery. The electrical treatment room contains an ultra-violet projector, radiant heat lamps, and apparatus for faradic, galvanic, and Schnee baths. The laboratory is fully equipped for investigation of the body fluids.

The hospital is a self-contained unit and all cooking is done by gas, the plant consisting of two Falcon ovens, a Richmond boiler, a Main grill and toaster, and a Main hot closet. The total consumption when the hospital is nearly full is expected to be 50,000 to 60,000 cubic feet of gas per month. Oil-fuel is used for both the central heating and the supply of domestic hot water. The plant for the former consists of two (one being a reserve) Britannia boilers fired by Oil-O-Matic burners. The latter is a Rapid-Heater fired by a similar but smaller unit. All the burners are entirely automatic in action. The oil tank (which is filled from outside the building) has a capacity of 1000 gallons of oil (4 tons), being about 21 days' supply in cold weather.

Heating of the rooms is by the Panel system, designed by Messrs. G. N. Haden and Sons. The heating elements on the ground floor consist, not of the usual type of exposed radiator, but of grids or panels of high-grade steel tubing of half-inch bore, which are attached to the lower edges of the rafters in the ceilings and being buried in the plaster are invisible. For large bedrooms as much as 120 ft. of tubing is used in one panel and for dormitories, corridors, &c., a series of panels is employed. All joints are welded and each section is tested to withstand 300 lb. pressure. Each panel is fed by a buried pipe which can be controlled in the same way as a radiator. The advantages of this heating system are the absence of cumbrous radiators, the avoidance of convection air currents and dust, with its disastrous effect on decorations, the high proportion of radiant heat, and the much slighter drying effect on the air. Owing to the narrow channels the water must circulate in, a half h.p. electric Rotary Impeller pump is inserted in the return main, near the boiler. On the first floor, heating is by the usual Ideal radiators in each room and corridor.

Each ward unit consists of a dormitory (8–11 beds), a day-room or lounge and dining-room, six private bedrooms, three observation private bedrooms, two bathrooms, a clinical treatment room, a service pantry, a verandah, three w.c.'s, a slops room, linen store and cupboards. The dormitory and corridor have controllable ceiling extractor ventilators, and all the rooms have controllable Ewart's ventilators in outer wall and fixed openings to the



Ground-floor plan.

corridor, &c. The south side of each dormitory consists of three sheets of glass, one 72 in. × 152 in. and two 72 in. × 72 in., with controlled opening. The verandah, 40 ft. by 16 ft. will accommodate eight beds, and faces south-west, the end being enclosed by glass. *It is so arranged that* a nurse working in the service pantry or the dormitory has a full view of all its area. The dormitory can also be observed from the pantry by day or night.

The main bathroom contains a Shanks porcelain continuous bath with thermostatic control in addition to usual equipment. The pantry contains a hot-closet and two gas-burners, by Main. All w.c. doors are fitted with a light bolt and have a strong handle grip on the outside.

The floors throughout *are of oak*, the doors and *other fittings* of Lagos *mahogany*, and all metal parts are chromium plated.

The building is protected against fire by two outdoor hydrants on the water main, a Norsen automatic hose-reel in the centre, and by a system of automatic electric fire alarms having 23 sensitive points, situated in the attics, connected *to an alarm* bell and indicator in the entrance hall.

The cost of the new hospital, including all new roads, fees, laying *out of* grounds, &c., is approximately £21,500 and the cost of furnishing and equipment is £2800, *making a* total finished cost per bed of just over £600.

PANEL AND CONTRACT PRACTICE

Medical Certification.

We published last week without comment a summary of Memorandum 329/I.G. issued by the Ministry of Health. While it may *not be* easy to realise at a glance the whole significance of the tables it contained, the figures are eloquent enough in proof that *medical* certification has not been an efficient check on claims for sickness benefit. The reader of the memorandum is forced to the conclusion that persons not entitled to sickness benefit, because they were not actually incapable of work, have nevertheless received such benefit. It is natural enough that persons with trivial illnesses should swell the number of claims, and it might be held wise to encourage such patients to cease work. Many minor ailments would thus be prevented from developing *into* disabling conditions; in certain short but acute illnesses complete rest in bed for a week may prevent permanent damag[illegible] from such passing indi[illegible] the present instance the [illegible] pharmacists have [illegible] Apart [illegible] against the Minis[illegible]position the other group of claims the fa[illegible] shows the highest rate of increase is that of married women, in many of whom there may be good and sufficient reason for the demand. Childbearing under present-day conditions, as the Ingleby lecturer has just pointed out, does induce a lowered standard of health, and *one* well-recognised branch of social service is to provide mothers' helps to meet this need. On the other hand, some of these *claims* may be due *to* the acquisitive habits of women with growing families.

No attempt is made in the memorandum to give a lead to practitioners as to the standard *they are* expected to adopt in estimating capacity for work. They must resist the importunities of the benefit seeker, but to do this they must be on the sure ground afforded by a thorough and complete examination. How difficult such an examination may be is well known to every practitioner. When one considers the traditional obstinacy of insured persons, their reluctance to submit to examination, and the difficulty of finding time in a busy surgery for comprehensive work, it is not surprising that the number of claims should increase. It may well be that not enough weight has been given in the memorandum to the change in the attitude of the insured population towards the insurance principle and to the increasing willingness at the present time to get something for nothing. The catch phrases of political controversy have come home to roost, and the cumulative effect of the caption "ninepence for fourpence" is difficult to estimate. Of actual malingering on the part of insured persons there is little evidence. That is admitted on both sides. But there is a lamentable misunderstanding of the nature of the benefits and the conditions necessary to become eligible for them. The objective of *the memorandum* presumably is the enlightening and education of the practitioner, and *who, it may be asked*, will undertake a like task for the insured person? Where carelessness can be *demonstrated* the medical profession has already shown its willingness to apply disciplinary measures. We *reported* last week at some length *proceedings* before the General Medical Council in several cases *of alleged laxity of certification. In this respect* the Scottish Board of Health seems to have stolen a march on the Ministry *in* Whitehall. But the *medical* profession will scan the horizon carefully *for any evidence of similar action on the part* of those *who claim* to represent the insured persons. It is imperative that they should not be misled by the agents of societies into an exaggerated belief in their right to benefit for sickness or disablement. The warning of the Ministry contained in the circular *quoted* in this *column last* week has not come too soon.

decline [illegible]

Essex Public Medical Service.

Dr. C. H. Panting presided at the annual meeting of the service held in London on June 11th. Continued progress, he said, had been made in all directions in spite of the prevailing depression and unemployment in certain parts of the county. The total number of subscribers on the books at the end of last December, after deducting cancellations, removals, and deaths, was 18,533—an increase over the previous year of 1783. Medical members showed an increase of 12 after deducting deaths and removals. The advantages the service had to offer to general practitioners should, he thought, be *more* widely known. The total amount paid out to doctor members during the year was £9533 18*s.* 1*d.*, the largest totals collected for individual doctors in each class of district being:—

	Total.		Total.
Urban	£808	Semi-rural ..	£251
Metropolitan ..	£398	Rural	£318

The service may help practitioners in *taking* over unremunerative clubs. Last year a new member in a rural area decided to transfer to the service *en bloc* a club which had been run for generations by the firm of doctors to which he had succeeded. The transfer was accomplished and the member *found* his income increased by about £100 a year. The excellent work of the paid collectors of the service is shown by the small amount of arrears incurred, averaging under one-half per cent. The *benevolent* fund, started in 1929, to provide appliances, such as belts and trusses, and certain expensive *medicines* excluded from the scheme, has helped 51 cases during the year and has a balance in hand. The report and balance sheet were adopted.

CORRESPONDENCE

A MATERNITY SERVICE.

To the Editor of THE LANCET.

SIR,—I have read with much interest the lectures by Prof. Blair Bell on the subject of Maternal Disablement, and I am emphatically in agreement with him in his conclusion that maternity hospitals should be attached to general hospitals. I should like to have found more emphasis laid on the importance of having senior resident obstetricians on the staff of such hospitals, as I regard these positions as vital, both for the welfare of the patients in the hospitals and for the training of consultants.

Midwifery differs from other branches of medical practice in that it combines long periods of patient watching with moments of intense activity at times that cannot be predicted with any accuracy. These conditions fit in badly with the appointments of a consultant doing private practice, and it is essential that there should be someone more responsible and capable than a house surgeon in continuous charge of the cases in the hospital. Again it is perhaps not going too far to say that tenure of such a position is an essential part of the training of an obstetrician. Midwifery has suffered in the past from the gynæcological attitude to the subject, and the best corrective for this will be a long period of residence in a maternity hospital as part of the training of the consultants in the future.

I am, Sir, yours faithfully,

HENRY H. MACWILLIAM,

June 15th, 1931. Medical Officer, Walton Hospital, Liverpool.

MATERNAL MORTALITY-RATE.

To the Editor of THE LANCET.

SIR,—Two footnotes to Prof. W. Blair Bell's second Ingleby lecture, published in your issue of June 13th (p. 1279) indicate that he does not quite realise how maternal mortality is calculated in this country, and what would be the effect on the rate if the changes were made in that method which he suggests. Prof. Bell states that "We . . . only count maternal deaths in women who give birth to live children." This is not so. The numerator of the fraction which constitutes the maternal mortality-rate includes the deaths of women from all causes during pregnancy, labour, or the puerperium (except criminal abortions) unless they have died from such diseases as do not arise from pregnancy, labour, or the puerperium. Prof. Bell probably has in mind the fact that the denominator of the fraction includes only live births and excludes both stillbirths and abortions, with the result that the rate is not a perfectly true index of the fatality of childbirth and pregnancy. It will be clear, however, that if the denominator were enlarged by the inclusion of these conditions the change would have the effect of lowering our maternal mortality-rate, not of increasing it.

I am, Sir, yours faithfully,

RALPH M. F. PICKEN.

Public Health Department, Cardiff, June 15th, 1931.

To the Editor of THE LANCET.

SIR,—I shall be obliged if you will allow me to correct a misstatement in my second Ingleby lecture, which was published in your issue of to-day's date. I said that the maternal mortality-rate in England and Wales is calculated in relation to live births, and this is true in the sense that stillbirths are not taken into account. I understand, however, that all maternal deaths are counted. It would appear, therefore, that the maternal mortality-rate recorded by the Registrar-General is higher than it should be, and not lower. In either case the mathematics are wrong, and it is high time some correct international standard was adopted for the sake of accuracy and to simplify comparison.

I am, Sir, yours faithfully,

Liverpool, June 13th, 1931. W. BLAIR BELL.

THE CLEAN MILK PROBLEM.

To the Editor of THE LANCET.

SIR,—I am glad to see Dr. Savage's letter in your issue of June 6th, and to find that we are agreed upon two very important aspects of the milk problem concerning which he says:—

> (1) "That any widespread system of pasteurisation will put back the clock as regards the production of clean milk. I think this is a probable and undesirable result and the evil should be minimised so far as possible. (2) I should prefer to see provided a clean safe pure milk-supply without any heat treatment."

If our country were wiser, it would be taking every step to eliminate disease from cattle in the interests of our agricultural community; but the fact that our industrial population is able to obtain large quantities of foodstuffs from distant countries blinds it to this necessity. It seems important therefore to arouse its interest, and this object might be attained if it were proved that the provision of fresh foodstuffs was of real importance, not only to the physique of the nation, but also to its power to resist disease. Concerning the first of these problems, Dr. Savage states:—

> "I do not think that its opponents have demonstrated, when efficiently performed, that it (i.e., pasteurisation) does any material damage to any known nutritional factor in milk, but the last word has not been said on this side and our knowledge is admittedly incomplete."

This is the fairest statement that I have yet seen from any of those who desire compulsory pasteurisation, but it can be said with truth that the problem of the relative nutritional values of different types of milk has never been adequately studied either in this or in any other country. The work of those who are studying the subject all tends to show that there may be a very real difference which is of importance to the nutrition of our people, and it is my opinion that those who wish for further milk legislation must satisfy themselves of the truth or otherwise of this possibility before they advocate a method which has always ended in reducing fresh milk to a minimum in those countries which have adopted it.

Dr. Savage speaks of opponents to the pasteurisation of milk, and apparently assumes that I am one of them. That is not the case. I believe that pasteurisation is rendering a very great service both to the country and to the milk industry, and that we owe a debt of gratitude to the members of the industry who have endeavoured to use it as efficiently as possible. It is doubtful if it ought to be allowed to become a master—and yet it is very important that we should eliminate milk-borne diseases. The question therefore is to what length we can go in view of the present position of the milk industry. I think myself that the following steps might be practicable: make it permissible to sell, in the fresh state, milk which attains to the standard that is now applied to Grade "A," and treat compulsorily all that which fails to do so. To my mind, this method of overcoming our difficulties, although not perfect, would go a long way towards eliminating the dangers of disease, and could be limited to a period of time if, in the interval, sufficiently active steps had been taken to promote the increase of milk from herds which do not react to the tuberculin test.

Moreover, my suggestion could be made much more widely applicable than the one that has been put forward by Dr. Savage, and the possibility of its attainment is well illustrated by the progress that has been made by small farmers in Cornwall in the production and sale of milk of this character. I should be grateful if Dr. Savage could find time to see that work for himself, since it is an admirable demonstration of what might be accomplished throughout Great Britain.

It surprises me that Dr. Savage should throw the responsibility for the study of the nutritional values of the different types of milk upon my colleagues and myself, since it is work which is really within the province of those who are responsible for human nutrition. I believe however we could render them material assistance, particularly by providing them with milk which had been produced under carefully controlled conditions.

I am, Sir, yours faithfully,
R. STENHOUSE WILLIAMS.

The National Institute for Research in Dairying,
Shinfield, near Reading, June 8th, 1931.

SURGICAL TREATMENT OF DUODENAL ULCER.

To the Editor of THE LANCET.

SIR,—Mr. E. R. Flint refers (p. 1321) to the results of the B.M.A. collective investigation into the after-results of gastro-enterostomy as reported by me.[1] He quite correctly gives the post-operative mortality-rate as 4·3 per cent. for the massed cases of duodenal and pyloric ulcers, but if he will refer to the addendum[2] to the investigation he will find that a much lower post-operative mortality is obtained when the operation of posterior gastro-enterostomy is combined with excision, cauterisation, or infolding of the ulcers. In the massed cases of duodenal and pyloric ulcers in which that operation was performed the post-operative mortality is only 1·6 per cent. It is only fair to point out that this particular type of operation was performed on a comparatively small number of cases—viz., 244—but I ventured in the addendum report, writing only as a statistician, to observe that the figures show that the operation, where combined with removal or infolding of the ulcer, is associated with a much lower post-operative mortality than in the cases of the other operations.

I am, Sir, yours faithfully,
Limpsfield, June 13th, 1931. ARTHUR P. LUFF.

To the Editor of THE LANCET.

SIR,—The clinical recognition and surgical treatment of duodenal ulcer owe so much to the genius of Lord Moynihan that the strongest grounds for differing from his appraisement of the value of any particular operation would alone justify a departure from the routine treatment as laid down by him. By his consummate skill and infinite attention to detail in pre- and post-operative treatment he has attained a degree of success with gastro-jejunostomy which, strive how I will, I have not been able to approach. In comparison with his 90 per cent., I cannot claim as cured—in the sense I used the term in my communication last week—more than 69 per cent. of patients who have failed to get permanent benefit by medical means. This measure of success falls so short of the ideal that it is almost compelling in its urge to search for a more satisfactory procedure. This I have attempted to do by exploring the possibilities of resection with the results already communicated. Lord Moynihan, I know, is, in general, in sympathy with surgical research of this kind, though I believe he feels strongly that such experiments should not be extended without adequate safeguard, with which sentiment every thoughtful surgeon must agree.

The points Mr. E. R. Flint brings forward are mostly answered in my paper. Particularly would I refer him to my remarks upon the fallibility of massed statistics. He criticises me for not resecting cases where the lesion was a small soft one which looked as though it might heal. This course seemed to me to be in the best interests of the patients, though resection in them would have been easy and swelled the statistics. His suggestion that the mortality would have been higher if ulcers adherent to the pancreas had been resected is not justified by the facts. Surgeons who resect duodenal ulcers know that the posterior wall is the commonest site for them. Very many of my resected ulcers have been adherent to the pancreas and in a considerable number the floor of the ulcer has been left on this viscus. I claim no more than to have made a serious investigation into the surgical treatment of duodenal ulcer which my results indicated was necessary, and I judged from Mr. Flint's publications of recent years that he also felt the need for it as he seemed to be abandoning gastro-jejunostomy for gastro-duodenostomy. No other English surgeon, as far as I know, has published his comparative results of resection and gastro-jejunostomy. If Mr. Flint would resect a series of ulcers I am convinced he would appreciate the truth of statements I have made.

I am, Sir, yours faithfully,
CHARLES A. PANNETT.

St. Mary's Hospital, W., June 14th, 1931.

AIR MOVEMENT IN SANATORIA.

To the Editor of THE LANCET.

SIR,—As I was on the staff of a chest hospital at the time when the open-air method began (about 1896) to be actively pushed in this country, and have been intimately concerned with sanatorium treatment from that time onwards, I am in a position to answer some of Dr. Macfie's questions in your issue of May 30th (p. 1211).

The effect of open-air methods has in my experience been entirely good. If only common sense is used, I do not believe that harm will ever result from these methods. Our object is to stimulate nutrition and reduce fever (if present) by cooling, but not chilling, the skin; and we must take into consideration both the meteorological conditions and the patient's individual reactive power. Wind and damp always increase the chilling effect. Whether snowflakes on the bed are likely to hurt the patient depends entirely upon circumstances. I have known some patients who remained perfectly comfortable in spite of drifting snow on their beds, and who objected to being brought into a more sheltered place.

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[1] Brit. Med. Jour., 1929, ii., 1074 and 1125.
[2] Ibid., p. 1212.

So many things affect the progress of the tuberculous that we cannot draw conclusions from Dr. Macfie's Canadian example without knowing much more of the circumstances, but I very much doubt whether an atmosphere which seems stuffy to a healthy visitor is likely to be advantageous to any tuberculous patient in any place. Nor do I believe that we are "overdoing the open-air treatment in this country," although the large size of many sanatoria may make individualisation difficult. Sanatorium methods have varied greatly in England; but the error, if any, has been (I believe) more often on the side of timidity than on that of rigour, because attendant nurses and doctors feel the cold more than a patient in bed suitably covered, especially if the former are insufficiently clad or accustomed to hot rooms. The only safe criterion is the physical effect on the patient at the time, and this needs watching.

The introduction of sanatorium methods here had a very marked effect in improving the faulty ventilation prevalent in private houses; and this was also improved by the return of our soldiers from fresh-air conditions abroad during the Great War. Recently there has been a slight relapse, but not to the bad old standard. The increase of motor traffic, with the noise and dust it causes, may have something to do with this relapse. It appears to me, however, that there are still far more open windows to be seen in cold weather than used to be the case, at all events in this part of England.

I am, Sir, yours faithfully,

Farnham, Surrey, June 9th, 1931. F. R. WALTERS.

TREATMENT OF CEREBRO-SPINAL FEVER.

To the Editor of THE LANCET.

SIR,—During the last few weeks I have been acting as medical officer (infectious diseases) for the county borough of Rotherham, and therefore have come into more immediate contact with the recent cases of cerebro-spinal fever.

The routine treatment so far has consisted of lumbar punctures when necessary, with intrathecal doses of antimeningococcic serum, along with intravenous and occasionally intraperitoneal injections of the serum. The difficulty in obtaining type sera in time to be of use has so far been almost insuperable. After trying all the usual methods with varying doses of serum (from 40 to 180 c.cm.) I felt sure that if it were possible to establish a further reaction in the patient some result might be seen. With this end in view almost three weeks ago I took one case, a girl of 12, meningococci present in cerebro-spinal fluid: four days of illness, progressively getting worse, at this stage comatose, delirium passed and patient sinking, incontinent, &c. At this stage I did a further lumbar puncture and injected 1 c.cm. of thick fluid into the gluteal muscles, as withdrawn. Within 12 hours there was slight improvement; 36 hours later temperature rose about 1° and she was conscious again; temperature came down from 101·2° to normal in about three days further and stayed down; the condition generally improved and the improvement is still maintained.

Case 2.—A man, aged 25 years, was admitted to me four weeks ago. Responded at first to routine treatment, then relapsed slightly and became stationary; after 14 days he became lethargic, incontinent, and after two further days was fully unconscious; I did further lumbar puncture, found thicker fluid than before, and injected 1 c.cm. in the gluteal muscles. His chart shows a slight reaction during the next 12 hours and during the next three days he improved slightly. I then repeated the dose, finding his fluid clear (meningococci still present but attenuated), giving a further 1 c.cm. into the gluteal muscles; he reacted slightly again in the next 12 hours, and since then has improved steadily, temperature running a normal course since 36 hours after the second dose.

Case 3.—A boy, aged 4 years, responded to routine treatment, and after nine days became retrogressive; given 1 c.cm. of his own cerebro-spinal fluid six days ago, he has responded satisfactorily so far.

I have no more cases to try further with, and although this treatment so far has promised extremely well, it cannot be regarded as conclusive. I *propose* to try it out further with any cases we may be unfortunate enough to collect. If, in the meantime, anyone with fresh cases would be good enough to try the method and let me know results I should be extremely grateful. These three cases have been exact parallels of numbers of fatal cases we have had, although differing individually in certain elements. There has been no local reaction to the injections of cerebro-spinal fluid in the muscle. I would suggest that the antiserum should still be continued.

I am, Sir, yours faithfully,

LANCELOT H. COPPING, M.B., Ch.B.,
Assistant Medical Officer of Health, County
June 15th, 1931. Borough of Rotherham.

AFRICAN TICK FEVER.

To the Editor of THE LANCET.

SIR,—In the historical account of this fever in Vol. 8 of the System of Bacteriology recently issued by the Medical Research Council no reference is made to my discovery of the spirochæte. I have no desire to revive the controversy of 27 years ago as to the relative parts played by Castellani, Bruce, and myself in the elucidation of the cause and mode of transmission of sleeping sickness. But in an authoritative work of this kind (and I should like to congratulate the editors on its excellence) justice should be done to the various observers who have worked at a disease. It was in August, 1903, when examining the blood of a suspected sleeping sickness patient that I discovered the spirochætes of relapsing fever on several occasions in the patient's blood. I showed the films to Colonel Bruce, and his comment was that they probably came from the distilled water which had been used in staining the blood film and that they were not in the patient's blood. I pointed out to him, however, that I had stained 20 or more films from other humans and animals that same day and this was the only one which showed the spirochætes. The case is fairly fully described in Part 5 of the reports of the Sleeping Sickness Commission, which was dated Entebbe, Nov. 20th, 1903. This report was, for some reason, withheld from publication until July, 1905, by which time Cook and Ross and Milne, all of Uganda, had rediscovered this spirochæte and obtained the credit for the discovery. The incident is mentioned in the first edition (1910) of Castellani and Chalmers's Manual of Tropical Medicine.

I am, Sir, yours faithfully,

London, W., June 10th, 1931. DAVID NABARRO.

ESTIMATION OF BASAL METABOLISM.

To the Editor of THE LANCET.

SIR,—I read with interest in your last issue the article by the late Dr. A. M. Gale and Mr. C. H. Gale in which they put forward a new formula for estimating the basal metabolic rate (B.M.R.) from the pulse-rate and pulse pressure. They show that this formula gives results closer to the B.M.R., as actually observed by Read in his large series, than does either of Read's formulæ which are also based on the pulse-rate and pulse pressure. On applying Gale's formula to the same series, it is found to give results which approximate closely to the observed B.M.R. when the latter is normal or increased. But when the observed B.M.R. is subnormal, Gale's formula (P.R.+P.P.−111) gives results that are too high, and the lower the observed B.M.R. the greater the error.

Using the same table of results as set out in the Gales' paper, the formula becomes more accurate if the figure subtracted from the sum of the pulse-rate and pulse pressure is increased as the sum of P.R.+P.P. becomes less. For practical purposes I suggest that when P.R.+P.P. is less than 111 (B.M.R. less than 0), the figure subtracted be 111+5, and that when P.R.+P.P. is less than 91, the figure subtracted be 111+10. The following table, taken from Table I. of the Gales' paper, will serve as the best illustration :—

Observed B.M.R. per cent.	Mean values.			Cases.
	P.R.+P.P.	P.R.+P.P. −116	P.R.+P.P. −121	
− 0 to − 9·9	109·1	− 6·9	..	137
−10 to −19·9	104·2	−11·8	..	119
20 to −29·9	93·3	−22·7	..	38
30 to −39·9	88·5	..	−32·5	4

I am, Sir, yours faithfully,

B. BUCKLEY SHARP.

Welbeck-street, W., June 17th, 1931.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

HONORARY FELLOWSHIPS AT THE ROYAL COLLEGE OF SURGEONS.

LAST Saturday the President of the Royal College of Surgeons in Ireland admitted to the honorary Fellowship of the College Dr. George Eli Armstrong, of McGill University, and Sir Hugh Mallinson Rigby, of London. The new Fellows were presented to the President by the honorary secretary of the College, Sir F. Conway Dwyer. He recalled that in Sir Hugh Rigby the College was welcoming an Irishman and a native of Dublin. Subsequently the new Fellows were entertained to dinner in the College.

SWEEPSTAKES : VOLUNTARY AND COUNTY HOSPITALS.

After another somewhat acrimonious debate in the Dáil last week on the report stage of the Public Charitable Hospitals (Amendment) Bill, it was agreed that one-third of the funds distributable to hospitals should, in future, go to the county hospitals. An important suggestion was made in the course of the debate by Dr. Hennessy—namely, that 10 per cent. of the proceeds of sweepstakes should be devoted to medical research. It is notorious that financial provision for research is badly needed in Ireland. The universities have no money to spare, and are not in a position to do much more than they are doing at present, and almost the only provision is certain grants given by the Rockefeller Foundation. It ought not to be beyond the power of the Dáil to insert a clause into the present Bill making, at any rate, some provision for medical research.

A PHARMACOPŒIA FOR THE IRISH FREE STATE.

In moving the second reading of the Pharmacopœia Bill last week, Mr. Richard Mulcahy, Minister for Local Government and Public Health, divulged the interesting fact that since the setting up of the Irish Free State Medical Registration Council the British Pharmacopœia had no longer a statutory authority in the Irish Free State, and he was advised that there was at present no pharmacopœia in force. The Bill proposes to adopt the British Pharmacopœia with such alterations, additions, and omissions as the Irish Medical Registration Council may decide on.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

RESEARCH ON THE BRAIN.

RESPONDING to an appeal by Prof. Wagner-Jauregg, the Nobel laureate, Prof. C. Economo has succeeded in organising an institute for systematic research on the brain. For over 20 years he has been working on these lines, and lately comparative anatomy has received his special attention. He has demonstrated a definite evolution or "progressive cerebration" in the ancestral line of mankind—an evolution manifested not so much by the increase of weight (comparative and absolute) as by increase of gyri and sulci. He believes that we are justified in assuming that the brain of man is still capable of unheard-of development.

Dr. A. Poller has devised a method for obtaining absolutely correct casts of the brain so that study of each separate part is possible. For instance, the anatomical substrate of musical talent can, he thinks, be discovered by comparing the brain of highly musical persons and those with no such gifts. The next object of this new institute will be to study the problem of talent, and for this purpose it is necessary to obtain the brains of eminent persons, excelling in some particular direction. An appeal has been published in the daily press asking for bequest of brains, not only by people who show special musical, mathematical, physical, or other abilities, but also by those who are left-handed or deaf-mutes. Prof. Wagner-Jauregg has already bequeathed his brain to the institute, which is housed in the Vienna Psychiatric Clinic.

STERILISATION OF MENTAL DEFECTIVES.

At a meeting of the Medico-Legal Society in Vienna, Dr. Höpler, the Attorney-General of Austria, made an interesting report on the present trend of opinion and the existing legislation on sterilisation of mentally defective persons. He expressed himself in favour of compulsory sterilisation on eugenic grounds, because the offspring of such people are a threat and a handicap to the human race. In this respect, Dr. Höpler is much further advanced than the new penal code which is under consideration in Germany, and to which Austria will probably consent. In Austria, the existing code threatens to punish any operator who performs any operation for other than therapeutic purposes ; the offence is qualified as : "inflicting serious bodily injury," and the punishment may be imprisonment for a long term, even if the patient has given his consent. It may be recalled that two years ago a certain surgeon in Graz, who performed temporary sterilisation on men, was sentenced to a heavy fine, and only acquitted after two appeals before the Supreme Court. In the new draft of the penal code, which has lately been worked out by the legal committee of the Austrian National Assembly, the consent of the patient to a sterilisation, performed "lege artis" by a qualified surgeon, shall not be deemed an offence, nor shall the surgeon be punishable in such an instance. On the other hand, sterilisation will not be regarded as a penalty or even as an alternative penalty for a criminal offence, and will not serve to shorten a term of imprisonment. Dr. Höpler is, as mentioned before, much more radical. He thinks that sterilisation has nothing to do with the punitive idea, and advocates a clause for the new code requiring that all persons from whom only defective children are to be expected should be subjected to a sterilising operation upon a judicial order. Such an order must, of course, be given only under the strictest control by State authorities and with greatest caution, including the examination of the patient by a committee of qualified medical men, and the right of appeal given to the family or the marriage partner of the person against whom such an order is made. The operation would be performed only in public institutions, and if possible should be centralised.

PUBLIC HEALTH SERVICES

MENTAL HOSPITAL REPORTS.

THE CHESHIRE COUNTY MENTAL HOSPITAL at MACCLESFIELD had 1334 patients on its register on the 1st day of 1930, and was then so crowded that only cute and urgent cases could be admitted. So far, no substantial progress has been made towards providing additional accommodation, although several plans have been discussed. The workhouses have been inspected with a view to using their space, but they were found to be entirely unsuitable. The recovery-rate for the year was 31·8 per cent. and the death-rate 4·8 per cent.—the lowest on record. Apart from a small epidemic of influenza and six sporadic cases of dysentery, the general health was satisfactory. Of the eight cases of general paralysis admitted, four were suitable for malarial treatment, and three of them were discharged fit for work. Light treatment was given to a number of patients, while others had radiant heat, prolonged and Turkish baths, and electrical treatment. The new occupation pavilion is nearing completion and the occupation officer has had six months' study leave for training. The dietary has been improved by the substitution of butter and English meat for margarine and foreign meat, respectively, but there has been no rise in the cost of maintenance. During the year 1876 investigations were carried out in the laboratory, which also undertakes the bacterial work of the Macclesfield public health authority. Two special reports deal with the family history and the relation of the cause of death to the type of insanity. It was found that the proportion of relatives suffering from some degree of mental affliction to the number of patients admitted is nearly 1 to 3; that tuberculosis has been displaced, during the last ten years, from its position as principal cause of death, and that there has been a very great diminution of fatal colitis and dysentery. The largest number of deaths from tuberculosis was found in the schizophrenic group; only 7 per cent. of patients dying from malignant growths belonged to this group. This is not entirely due to the age factor, since 8 per cent. of melancholics and 20 per cent. of paranoid cases died from malignant tumours. No schizophrene died of intestinal catastrophe. The committee have decided to open an out-patient clinic at the institution and to appoint a social worker. The systems of trial and parole are freely used. During the year 15 nurses and five attendants obtained their R.M.P.A. certificate, one nurse with distinction; 83 per cent. of the male nurses and 37 per cent of the female nurses have been in the institution for more than five years. Women are employed for all work, except for some night duty in the male wards.

The GLASGOW ROYAL ASYLUM had 555 patients in residence at the end of last year; of the 150 patients admitted during the year, 74 were voluntary boarders. The directors have acquired an estate in Dumbartonshire which is to be opened as an ordinary nursing-home, without formalities of admission, for patients suffering from incipient nervous and mental disorder. It has been suggested that the former East House kitchen and mess-rooms should be converted into a reception unit with a hydrotherapeutic and electrical department, and a library upstairs. The recovery-rate for the year was 34·8 per cent. and the death-rate 7·4 per cent. A careful study of the malarial treatment of general paralysis has been made; the results have been most encouraging. The occupation therapy department continues to work well. The occupation officer finds that basketry is one of the most useful crafts, as it involves many activities, from the elementary process of sand-papering upwards, and the concentration required for the actual weaving is often just what is necessary to hold the patient's attention. The dental surgeon saw 239 patients during the year. The hospital has also a complete visiting staff of specialists. The convalescent villa at Skelmorlie continues to give great pleasure to those who go there for a change or for a period before discharge. Over 150 patients have parole within the grounds. All nurses now take the examination of the General Nursing Council.

HOSPITAL FOR PRIVATE PATIENTS.

The admissions to THE LAWN, LINCOLN, for the year 1930 included 22 voluntary boarders and 10 certified patients; many of the voluntary patients were definitely psychotic and certifiable, but the medical superintendent finds it perfectly possible and satisfactory to treat them on a voluntary basis. Of the 38 inquiries which did not lead to admission a very large number probably required treatment, but the charitable resources of the hospital were insufficient to meet their needs. The recovery-rate for the year was 66·6 per cent., and five certified patients died from natural causes. The general health was good and there was no epidemic disease. Many patients visited the theatre, concerts, and cinema, and an increasing number go out on parole. A masseuse who worked at the hospital during her summer vacation proved to be of great benefit to the patients, and it is hoped before long to appoint a full-time officer. The valuable work of this institution is hampered by lack of funds, and a special appeal is being made this year for donations and annual subscriptions.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 6TH, 1931.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 83; scarlet fever, 1380; diphtheria, 767; enteric fever, 46; pneumonia, 794; puerperal fever, 31; puerperal pyrexia, 111; cerebro-spinal fever, 53; acute poliomyelitis, 2; acute polio-encephalitis, 2; encephalitis lethargica, 13; dysentery, 9; ophthalmia neonatorum, 113. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on June 9th–10th was as follows:—Small-pox, 136 under treatment, 2 under observation (last week 149 and 7 respectively); scarlet fever, 1134; diphtheria, 1381; enteric fever, 14; measles, 175; whooping-cough, 425; puerperal fever, 36 (plus 11 babies); encephalitis lethargica, 195; poliomyelitis, 1; "other diseases," 157. At St. Margaret's Hospital there were 19 babies (plus 0 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was 1 death from small-pox, 1 (1) from enteric fever, 26 (0) from measles, 5 (2) from scarlet fever, 20 (6) from whooping-cough, 18 (2) from diphtheria, 40 (5) from diarrhœa and enteritis under two years, and 30 (5) from influenza. The figures in parentheses are those for London itself.

The case provisionally classified to small-pox was assigned to East Ham C.B. No death from meningococcal meningitis occurred in London. Five deaths from measles were reported from Birmingham, 4 each from Liverpool and South Shields. Diphtheria claimed 3 victims at Hull. Diarrhœa was credited with 10 deaths at Birmingham, 4 at Coventry.

The number of stillbirths notified during the week was 287 (corresponding to a rate of 39 per 1000 births), including 61 in London.

PORT SANITARY AUTHORITY.

IN his first annual report to the PORT OF BRISTOL authority Dr. R. H. Parry mentions that during the year 1930 1160 ships arrived from abroad at the three ports of Bristol, Avonmouth, and Portishead, and 5846 coastwise. Of these 187 were visited by the medical officer, 3378 by sanitary inspectors. No case of cholera, yellow fever, small-pox, or typhus came to notice, but one case of (clinical) plague, an inguinal bubo, in a second engineer, was found on a grain ship from the Black Sea. The case was removed to hospital and did not at this date prove bacteriologically positive. Luckily there were few rats aboard, the grain cargo was discharged under supervision, the one rat trapped was negative; the ship was fumigated with hydrocyanic acid, no further rats being found. The rats on the neighbouring dockside when examined were also found free of plague. During the year 1344 rats were destroyed on vessels, 3107 on shore; 408 were examined, all free of plague. Care is being taken continuously to reduce rat harbourage on ships and ashore. Experiments with an electric rat-guard proved unsatisfactory, for even a direct current of 500 volts merely stunned a rat for a couple of minutes. Of 3378 vessels examined for nuisances, 12 were found defective in original construction, 197 through wear and tear, and 410 were dirty or verminous. Of venereal disease 32 cases came under the notice of the port medical officer; 158 persons made 553 gratuitous attendances to the clinic provided. Much food reaches England through Bristol, and is for the most part (the report says "invariably") in good condition; some 34 tons of wheat, 10 of maize, and 10 of barley were condemned. Bananas, 102,163 tons arrived; none reported unsound. Of 11 samples of water taken from ships (reason for choice unstated) 8 were classed as unfit, 2 reports were indefinite, and only one (from Madeira) was declared perfectly sound. Presumably the water on board merchant ships is generally better than thus appears; in fact only two cases (five years average, 3·8) of typhoid were reported on board all incoming vessels during the year. No insanitary conditions were found among 29 canal boats inspected.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

PUBLIC HEALTH IN MAURITIUS.

ON the second reading in the House of Commons on June 12th of the Mauritius Loan (Guarantee) Bill, Mr. LUNN, Under Secretary for the Dominions (in the absence of Dr. Drummond Shiels, the Under Secretary for the Colonies) said that the position in regard to public health in the Colony of Mauritius was that the island was over-populated. The density of the population was 550 to the square mile. The bulk of the population lived normally on the very limit of bare subsistence, and it was inevitable that in times of depression such as now existed some of them who became unemployed or received a diminishing return from their small holdings should be forced below that limit. The only remedies for this state of affairs were an increase in the productivity of the island or a decrease in its population. Measures for increasing the productivity of the island were under consideration by the Agricultural Department of the Colony and the agricultural advisers of the Secretary of State for the Colonies. On the strictly public health side there was little that could be done to remedy under-nourishment. The record of the Government of Mauritius in public health matters was, he understood, a good one. They had in recent years spent very large sums on public health works, such as antimalarial measures and the improvement of water-supply, and there was no doubt that such efforts would continue to be prosecuted as funds were available. If the measure of assistance now proposed under this Bill had not been given to the Colony the economic position would very rapidly have become worse. Under-nourishment would not only have become more widespread, but might have developed into actual starvation.

After some debate the Bill was read a second time without a division.

WORKMEN'S COMPENSATION ACT.

On June 11th in the House of Lords the Royal Assent was given to the Workmen's Compensation Act, 1931, the Alexander Scott Hospital Order Confirmation Act, 1931, and the Liverpool University Act, 1931.

BETHLEM HOSPITAL BILL.

In the House of Lords on June 16th Lord PONSONBY moved the second reading of the Bethlem Hospital (Amendment) Bill. He said that the Bill was necessary to enable Bethlem Hospital to be used as a war museum. By the generosity of Lord ROTHERMERE, the building and site had been handed over to the London County Council as an open space. It was proposed under the Bill to use the centre part of the building, which contained the dome, as the war museum. The rest of the site would remain in the hands of the London County Council as a garden and open space. The result of the Bill would be to relieve the present overcrowding in the Imperial War Museum at South Kensington. The Bill was read a second time.

HOUSE OF COMMONS.

WEDNESDAY, JUNE 10TH.

Insured Women and Dental Benefit.

Mr. LOVAT-FRASER asked the Minister of Health the number of insured women under the National Health Insurance Act who were entitled to additional benefit, No. 9 (dental benefit), under the valuation schemes of approved societies for the second valuation period, and the number of insured women who were, or would be, entitled to such benefit under the third valuation schemes.—Miss SUSAN LAWRENCE (Parliamentary Secretary to the Ministry of Health) replied: The number of insured women members of approved societies and branches in England having schemes of dental benefit following the second valuations was approximately 4,250,000. The complete results of the third valuation are not yet available, but my right hon. friend regrets to say that from the results already received it is evident that there will be a considerable reduction in the number of women entitled to dental benefit.

Dental and Ophthalmic Treatment.

Mr. JOHN asked the Minister of Health whether he proposed to make dental and ophthalmic treatment statutory benefits for all members of approved societies under the National Health Insurance Acts; and, if so, at what date.—Mr. GREENWOOD replied: No such proposal is at present in contemplation.

Legislation to Amend the Children Act.

Viscountess ASTOR asked the Prime Minister whether, having regard to the need for a new Children's Bill, he could find time for the proposed Government Bill to be taken this session.—Mr. MACDONALD replied: The Government are fully aware of the need of legislation to amend the Children Act, but I am afraid that, in view of the present state of Parliamentary business, I can hold out no hope of time being found this session for the proposed Children's Bill.

Prisoners and Solitary Confinement.

Mr. FREEMAN asked the Home Secretary the total number of prisoners who were in solitary confinement; the maximum period for any prisoner; the main causes for such treatment; and whether he was satisfied with the necessity of dealing with them in this way.—Mr. CLYNES replied: Solitary confinement was abolished long ago. Further, the period of employment in separation was reduced in 1919 to 14 days and was done away with altogether by my Prison Rules of April 4th last. There is now no class of prisoner which as such is excluded from associated labour. For breaches of prison discipline, prisoners are liable to be punished by close confinement, but after the first day on promise of good behaviour are allowed one hour's exercise daily and to attend chapel on Sundays. The maximum period which may be ordered by a prison governor is three days, by visiting justices 14 days, and by boards of visitors or directors of convict prisons 28 days. The modern tendency is to substitute loss of privileges for close confinement.

The Factory Inspectorate.

Major COLVILLE asked the Home Secretary whether he would furnish a statement showing the additional appointments made to the factory inspectorate following upon the report of the departmental committee on the factory inspectorate.—Mr. CLYNES replied: Following the departmental committee's report, the Government decided to increase the general inspection staff from 180 to 243, the medical staff from 5 to 8, the electrical staff from 5 to 12, and the engineering staff from 6 to 10, these increases to be spread over a period of five years. Up to the present the general inspection staff has been increased by 29, the medical staff by 3, the electrical staff by 5, and the engineering staff by 3.

FRIDAY, JUNE 12TH.

Poor-law Relief in Plymouth.

Mr. HORE-BELISHA asked the Minister of Health the number of persons in receipt of poor-law relief in the city of Plymouth, specifying categories for May, 1931.—Mr. GREENWOOD replied: The following statement gives the information asked for: Institutional relief (including casuals, but excluding rate-aided patients in mental hospitals), 576; domiciliary relief (excluding persons in receipt of domiciliary medical relief only), 5411; total, 5987.

MONDAY, JUNE 15TH.

The Grading of Milk.

Brigadier-General CLIFTON BROWN asked the Minister of Agriculture whether, when considering with the Ministry of Health alterations in the regulations for the grading and designations of milk, and before coming to any decision he would consult the advisory committee of the Agricultural Council for England and Wales on this matter.—Miss SUSAN LAWRENCE replied: My right hon. friend has already received a report on this subject which was adopted by the Council of Agriculture for England last year. He will consider it in consultation with my right hon. friend, the Minister of Agriculture and Fisheries, but legislation would be necessary before any alterations could be made in the order as to the grading and designations of milk.

An All-in Insurance Scheme.

Sir GEORGE PENNY asked the Minister of Health whether the Government would consider the possibility of investigating an all-in insurance scheme, including unemployment and health benefits and pensions, to be applicable to a large section of the population.—Miss SUSAN LAWRENCE replied: This was one of the subjects considered by the Cabinet Committee which was set up to make a general survey of the National Insurance and Pensions Schemes, and is dealt with in their report, which is still under the consideration of the Government.

Medical Assistance in Flying Accidents.

Capt. BALFOUR asked the Under Secretary for Air if he was aware that after the flying accident resulting in the death of Mr. Kenneth George Murray at Marshall's Aerodrome during the Cambridge public flying display recently, 20 minutes elapsed before a doctor's services were procured; that when the injured pilot had been extracted, after 20 minutes work in the wreckage, a further period of waiting occurred before the ambulance arrived; if he would investigate the reason why neither medical nor ambulance transport services were available for instant use; whether his department had been consulted or had offered assistance in the organisation of this meeting; and if he would issue immediate regulations to prevent reoccurrence of such lack of safety facilities at all future public flying displays.—Mr. MONTAGUE replied: Inquiry is being made into the points mentioned, but the display at which this regrettable accident occurred was a privately arranged meeting held at an aerodrome licensed for private use only. One of the conditions of the licence is that "adequate first-aid appliances must be kept at the aerodrome."

TUESDAY, JUNE 16TH.

Army Horses Sold for Human Food.

Mr. DAY asked the Secretary for War the number of Army horses that had been cast during the 12 months ended to the last convenient date and sold for human consumption; and to whom they were sold.—Mr. T. SHAW replied: During the year ended May 31st last, 727 Army horses were sold as fit for human consumption. Such animals are destroyed in the presence of a military representative. The purchasers were Messrs. Harrison, Barber and Co., Ltd., London, and Messrs. Smith and Spalding, Ltd., London.

Mental Defectives in Scotland.

Mr. SINKINSON asked the Secretary for Scotland the number of mental defectives under 18 years of age in Scotland; how many were educable and uneducable; and how many were in institutions, criminal and otherwise.—Mr. WESTWOOD (Under Secretary of State for Scotland) replied: The duty imposed upon education authorities in Scotland by the Mental Deficiency and Lunacy (Scotland) Act, 1913, to ascertain what children residing within their areas are mentally defective within the meaning of the Act and to make provision for the education of those who are capable of receiving benefit from special instruction extends only to children between 5 and 16 years of age. According to the last return made by education authorities, the number of children between these ages who were ascertained by them to be mentally defective was 4910, of whom 3993 were ascertained to be educable and 917 uneducable. The number of educable mentally defective children receiving instruction in schools and institutions is 3938. Between the ages of 5 and 18 years there are 192 educable and 696 uneducable mental defectives certified under the Act and in residence in certified institutions, and 110 uneducable mental defectives under guardianship in private dwellings. There are no mental defectives under the age of 18 in residence in the State institution.

Unidentified Bodies in London Mortuaries.

Dr. HASTINGS asked the Home Secretary the number of unidentified bodies taken to the mortuaries in London in any one recent year.—Mr. CLYNES replied: The most recent year for which figures are available without special collection is 1927. Seventy-seven bodies of newly born infants and 74 other bodies found dead in that year remained unidentified two months after the end of the year. It is understood that these numbers fairly represent the average.

DONATIONS AND BEQUESTS.—Mrs. Eleanor Hood-Rowan, of "Rowantree," Warren-road, Blundellsands, left £34,091. After certain personal bequests the residue of the property was left as to: Two-ninths to Liverpool Infirmary for Children, Myrtle-street, Liverpool; two-ninths to the Children's Hospital at Leasowe for Crippled Children; two-ninths to Dr. Barnardo's Homes; two-ninths to the Waifs and Strays' Society; and one-ninth to the Institute for the Blind, Hardman-street, Liverpool.—Miss Ada Bilton, of Yew Tree, Kingswood-lane, Hindhead, Surrey, among other bequests, left her real estate at Shottermill, Hindhead, Surrey, to the Royal Hospital for Incurables, Putney, desiring that it should be used as a country home for patients of the hospital, and £2000 to Florence Nightingale Hospital for Gentlewomen, Lisson-grove, and £500 to the London Hospital for a cot, to be called the "Charles Bilton Cot."

week 149 and 7 respectively); scarlet fever, 1134; diphtheria, 1381; enteric fever, 14; measles, 175; whooping-cough, 425; puerperal fever, 36 (plus 11 babies); encephalitis lethargica, 195; poliomyelitis, 1; "other diseases," 157. At St. Margaret's Hospital there were 19 babies (plus 9 mothers) with ophthalmia neonatorum.

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PORT SANITARY AUTHORITY.

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PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

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Melville, M.B. Melbourne, Guy's; Joyce Rewcastle Woods, M.B. Lond., Royal Free; Bernard Willis, M.D. Toronto, London; Alan Harding Lendon, M.B. Adelaide; John Arthur Rolland O'Regan, M.B. N.Z.; Maurice Backwell, M.B. Leeds; George Hayes Brandis, M.B. Melbourne, Guy's; Keith Buchanan Bridge, M.B. N.Z., Otago and St. Bart.'s; Herbert Alfred Brittain, M.B. Dublin; Eardley Lorimer Button, M.B. N.Z., Otago and Guy's; Ian Ayliffe Hamilton, M.B. Adelaide, London and St. Bart.'s; Hyman David Isaacs, M.D. Manitoba, Guy's; John Kelly, M.B. N.U.I., Cork and London; Michael Leo Kennedy, M.B. N.U.I., Dublin and Guy's; Alan Livingston Kerr, M.B. Liverpool; Samuel Norman Lytle, M.B. Belfast, St. Bart.'s; George Alexander Mason, M.B. Durham, St. Thomas's; James Hugh O'Donnell, M.B. Leeds, St. Bart.'s; Cyril Moulson Smithies, M.B. Leeds, Guy's; Graeme Gibson Talbot, M.B. N.Z., Otago; Thomas Thornton, M.B. St. Andrews, London; Wilfred Keith Welsh, M.B. Toronto, London.

Diplomas of Membership were granted to the following candidates who had previously passed the examinations of the Examining Board, and had now complied with the Regulations:—Partap Chandra (Punjab and Cambridge), Hilary S. M. Hadaway (Royal Free), and Thomas Standring (King's Coll. Hosp.).

At the primary examination for the Fellowship, held from June 2nd to 12th, for which 169 candidates presented themselves, 56 were approved and 113 were referred. The following are the names and medical schools of the successful candidates:—

F. W. Allinson, M.B. Lond., Univ. Coll.; S. O. Aylett, King's Coll.; J. E. M. Ayoub, St. Thomas's; P. S. Bassalvi, M.B. Punjab, King's Coll.; Diana J. K. Beck, M.B. Lond., Royal Free; D. L. C. Bingham, Edinburgh and Middlesex; E. W. Bintcliffe, St. Bart.'s; Edith J. R. Browne, Royal Free; K. L. Buxton, St. Thomas's; W. G. Campbell, M.B. St. Andrew's, Middlesex; S. G. Clayton, King's Coll.; Gladys E. Clyne, Royal Free; E. A. Danino, St. Bart.'s; G. B. Davis, King's Coll.; Rosalind M. S. Derham, Bristol and King's Coll.; K. C. Eden, Univ. Coll.; C. G. Ferguson, M.D., Queen's Univ., Kingston; W. J. L. Francis, M.B. Glasg., St. Mary's; P. E. Glynn, M.R.C.S., Leeds, Middlesex, and King's Coll.; W. H. Graham, M.B. Glasg.; T. F. R. Griffin, St. Mary's; J. O.

WORKMEN'S COMPENS.

On June 11th in the House of
Assent was given to the Workmen
Act, 1931, the Alexander Scott
Confirmation Act, 1931, and the Liv
Act, 1931.

BETHLEM HOSPITAL

June

M.D.

Sukhasagar Datta.

FINAL EXAMINATION (PART II.) FOR M.B., CH.B.

With Second-class Honours.—Elizabeth S. G. Owen.

Pass.—*L. P. Ashton, J. E. Brown, †L. R. Jordan, and R. H. Moore. Group II. (completing examination): Eveline M. D. M. Collinson and Rowena M. Hickman. Group I.: W. A. F. Taylor. Group II.: O. J. P. Bollon.

* Distinction in Surgery and Obstetrics.
† Distinction in Medicine.

FINAL EXAMINATION FOR B.D.S.

M. J. Ryan.

FINAL EXAMINATION FOR L.D.S.

E. V. O'Hara.

King Edward's Hospital Fund for London.

The Prince of Wales presided last week at the annual council meeting of this Fund, when a message was read from the King expressing His Majesty's satisfaction that the fund was able in 1930 to provide the increased distribution of £266,000 out of the current income of the year. In 1929 the distribution was £250,000. The Prince spoke of his fear that the present year would be an anxious one for the voluntary hospitals, but he took courage from the fact that the voluntary system had survived many periods of depression in the past, and that in recent years income had grown steadily. He mentioned "an entirely new and unprecedented item"—a special trust fund of £20,000 given by an anonymous donor, the income of which is to be used primarily to assist a hospital to pay off its building debt. The legacy of £50,000 from the late Sir Otto Beit brought the total munificence of Sir Otto to the Fund to £106,000. It was explained that the new trust fund was to be applied to the reduction of capital charges on hospitals in Deptford, Greenwich, Lewisham, and Woolwich, and that the first beneficiary will be the Miller General Hospital. The management committee is ignorant of the identity of the donor.

Epsom College.

St. Anne's Scholarship.—The council will shortly elect a girl to a St. Anne's Scholarship of £120 a year. Candidates must not be less than 9 years of age on July 20th, and must be orphan daughters of medical men who have been for not less than five years in independent practice in England or Wales. Application must be made by July 2nd, on a form to be obtained from the secretary of the College, at 49, Bedford-square, London, W.C. 1.

London School of Hygiene and Tropical Medicine.

The next series of eight lectures and demonstrations on tropical hygiene, intended for men and women outside the medical profession proceeding to the tropics, will be given by Lieut.-Colonel G. E. F. Stammers from July 6th to 10th. Particulars may be had from the secretary of the school, Keppel-street, Gower-street, W.C. 1.

Diploma in Psychological Medicine.

The University of London has added Stoke Park Colony, Stapleton, Bristol, to the list of institutions recognised for practice under Regulation 3 for the D.P.M. for candidates offering mental deficiency as their special branch under Regulation 4.

Royal Medico-Psychological Association.

The ninetieth annual meeting of this association will be held from July 8th to 11th at the Royal College of Physicians, Dublin, under the presidency of Dr. R. R. Leeper. On July 10th the association will be received at the Vice-Regal Lodge by the Governor-General and Mrs. McNeill.

Royal Society of Medicine.

Nichols Prize.—At the last meeting of the council this prize was awarded to Dr. John Smith, of Aberdeen, and to Dr. R. R. Armstrong and Mr. H. Burt-White (a conjoint contribution), of St. Bartholomew's Hospital. The prize s offered, in accordance with the will of the late Dr. Robert Thomas Nichols, once every three years, for the most valuable contribution by a British subject towards "the discovery of the causes and the prevention of death in hildbirth from septicæmia."

The *Jenner Medal* was awarded to Dr. T. H. C. Stevenson, Medical Statistical Officer at Somerset House. *It is given* o persons whose work has been pre-eminent in the prevenion and control of epidemic disease.

University of Manchester.

The Council have appointed Dr. Stephen Leonard Baker s Procter professor of pathology and pathological anatomy, n succession to Prof. J. Shaw Dunn.

Dr. Baker qualified from the London Hospital in 1913. fter holding various junior appointments in that hospital, he as for three years during the war a temporary surgeon in the oyal Navy. Since 1922 he has held the post of senior assistant n the Bland-Sutton Institute of Pathology at the Middlesex ospital, and in 1928 was appointed Reader in Morbid Anatomy nd Histology in the University of London. His researches over a wide field in bacteriology and pathology. Recently it as been chiefly concerned with problems connected with alignant disease.

Society for Constructive Birth Control.

The medical committee of the Constructive Birth Control linic has arranged special sessions devoted to demonstrating o medical practitioners the practical details of contraceptive echnique, the insertion of various types of pessaries, the etermination of sizes used in various circumstances, &c. hese demonstrations are combined with brief lectures in equence made by the president of the society (Mrs. Marie topes, D.Sc.), various members of the medical committee, nd the midwife nurse-in-charge at the clinic. The leading ethods used in clinical technique will be covered in one fternoon. Sessions will be held from 2.30 till 5 P.M. on he first Wednesdays in each month. Previous application hould be made in writing to the hon. secretary of the onstructive Birth Control Clinic, 108, Whitfield-street, London, W. 1.

Oxford Ophthalmological Congress.

The twenty-first annual meeting of this congress will egin at Oxford on Thursday, July 9th. After the opening y Mr. A. B. Cridland, the Master, a symposium on the iagnosis of Intracranial New Growths will be introduced y Mr. Leslie Paton, the *other speakers* including Sir erry Sargent, Dr. H. M. Traquair, Mr. Norman Dott, nd Prof. Artur Schüller (Vienna). On the same afternoon rof. G. Elliot-Smith, F.R.S., will give an address on the volution of the Instruments of Vision. In the morning f Friday, the 10th, Dr. Baillart (Paris) will speak on Tonometry, and Mr. Philip Adams *will deliver the Doyne* emorial lecture, under the title of an Ophthalmological Mélange. In the afternoon Mr. James Craig and Prof. Schüller will open a discussion on Penetrating Wounds of he Eye. The meetings will end at midday on Saturday.

National Association for the Prevention of Tuberculosis.

On Thursday next the seventeenth annual conference of the National Association for the Prevention of Tuberculosis opens at Margate under the chairmanship of Sir Arthur Stanley. The proceedings, which will continue till Saturday, will be devoted to the Protection of the Child from Tuberculosis.

London Hospital Medical College.

The distribution of prizes will be made by Lord Macmillan on Wednesday, June 24th, at 3 P.M., in the library of the College.

Gloucester Royal Infirmary Extension.

On Thursday last week Princess Mary laid the foundation-stone of extensions which will cost £40,000.

A Memorial Ward at Wells.

There was recently opened at Wells cottage hospital a maternity ward as a memorial to Miss Phyllis Aileen Manning who died, at the age of 25, after six months' work as a medical missionary in Uganda. The ceremony was performed by Mrs. Wynne Wilson, wife of the Bishop of Bath and Wells. Miss Manning was the daughter of the senior honorary surgeon of the hospital.

"Royal" Hospitals.

The committee of the Bolton Infirmary and Dispensary have decided to petition the Home Secretary for the right *to prefix the word "Royal" to the title of the hospital.* The reasons given are that, with such a name, it would be easier to obtain doctors and nurses, and that applicants for positions on resident medical staffs "seem to prefer a hospital which has the word 'Royal' prefixed."

Coventry and North Warwickshire Hospital.

The Hospital Saturday Fund committee has presented to this institution an electrocardiograph apparatus in memory of the late Mr. G. Hadfield, the originator of a movement for its acquisition, and it was recently unveiled by his widow. *At the ceremony it was stated that out of* 1672 deaths in the city of Coventry last year 311 were attributed to heart disease.

Work of Orthopædic Hospitals.

The annual report of the Prince of Wales's Orthopædic Hospital, Cardiff, and its country branch at Crossways, Cowbridge, states that last year a total of 665 patients were admitted; there were 2173 out-patients.—Speaking last week at the cripples' training centre of the Manchester, Salford and District Council for Cripples, at Grangethorpe, Sir Robert Jones commented upon the pressing need for training colleges for those injured at work and in other ways, whose number in the last ten years exceeded the war-time total.

Glasgow Dental Hospital.

The Earl of Home, presiding at the annual meeting of the Incorporated Glasgow Dental Hospital last week, referred to the very great increase in service to the community which would be made possible by the new home for the hospital. They would have 70 operating chairs each with self-contained surgical unit, instead of 35 as before. Children would be *accommodated in a special department and an X Ray plant* would be installed. The laboratory would be twice the size, and provision would be made for research. In response to the appeal for £90,000 to meet the cost of equipping the new hospital, nearly £40,000 had already been received, but he made urgent appeal to the citizens to aid the hospital so that it might open free of debt. £2000 had been promised by the Dental Board of the United Kingdom on condition that £1700 was raised in Glasgow by July 1st, and they were still £400 short of this quota.

Hospital Treatment for the Middle Classes.

Sunderland Royal Infirmary has adopted a scheme to enable middle-class patients to avail themselves of all its private ward facilities on payment of £1 10*s.* per annum. The scheme applies to persons whose incomes fall within the following limits: Single adult persons under £300 per annum; married couples without children under 16, £400 per annum; widows and widowers *with a child or children* under 16, £400 per annum; married couples with a child or children under 16, £500 per annum. Single persons between the ages of 16 and 21 years who are not in receipt *of more than £100 per annum* will be admitted into the scheme on payment of an annual premium of £1. People with incomes above the insurance scheme limits may be admitted to private rooms, the charge for which will be not more than £5 5*s.* per week, with a minimum of £2 2*s.* The premium covers all medical and surgical nursing and maintenance costs while the patient is in the infirmary, but does not cover the cost of any special appliances, drugs, or instruments which may be ordered for treatment after discharge.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lts. J. Cussen, E. O'Reilly, *and* T. G. B. Crawford to be Surg. Lt.-Comdrs.

The following appointments have been made: A. B. Clarke to *Vivid* for R.N. Barracks, Devonport.

Surg. Lt. R. G. Dingwall to *Herald.*

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Comdr. A. G. Reade to *Repulse.*

Surg. Lt.-Comdrs. J. E. Purves transferred to London Divn.; and S. W. Davidson to *Frobisher.*

Surg. Lts. F. W. Chippindale transferred to Sussex Divn.; and F. D. Manners (D). to *Pembroke.*

Surg. Lt. (D).—W. R. Young to *Victory* for Haslar Hospital.

ROYAL ARMY MEDICAL CORPS.

Maj. J. W. Houston is placed on the half pay list on account of ill-health.

Capt. S. Griffin, late 3rd Bn., R. Ir. Regt., is granted a temp. commn. in the rank of Lt. and temporarily relinquishes the rank of Capt.

F. K. Bush to be Lt. (on prob.).

TERRITORIAL ARMY RESERVE OF OFFICERS.

Capt. P. J. Stokes from Active List to be Capt.

ROYAL AIR FORCE.

Lt. R. N. Kinnison (T.A.R.O.) is granted a short service commission as a Flying Officer for three years on the Active List.

RESERVE OF AIR FORCE OFFICERS.

Flying Officer S. S. Proctor relinquishes his commission on completion of service.

Medical Diary

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Thursday, June 25th.—11 A.M.–5.30 P.M., Exhibition of Instruments. Urology. 5.30 P.M., Discussion: The Treatment of Inoperable Carcinoma of the Bladder. Opener: Mr. Ogier Ward.

Friday.—Otology. Summer Meeting at Oxford. 2 P.M., Paper: Dr. W. T. Hillier: The Lateral Line of Sense Organs. 5 P.M., Demonstration: Dr. M. MacNaughton Jones: Models illustrating the Physiology of the Ear. Papers: Mr. E. A. Peters: A Test for Maximum Tuning Fork Hearing. A Case of Cerebellar Abscess Drained Anterior to the Lateral Sinus.

Saturday.—Otology. Summer Meeting at Oxford continued (see above). 10.30 P.M., Open discussion: The Physics of Sound and the Physiology of Hearing.

MEDICO-LEGAL SOCIETY.

Thursday, June 25th (at 11, Chandos-street, Cavendish-square, W.), Dr. T. H. Blench: Crime Investigation in Paris, followed by a discussion.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

Monday, June 22nd, to Saturday, June 27th.—Medical Society of London, 11, Chandos-street, Cavendish-square, W. M.R.C.P. Evening Lecture at 8.30 P.M. Tues., Dr. R. A. Young: Some Lung Conditions Simulating Pulmonary Tuberculosis. Fri., at 10, Beford-square, W.C., at 8.30 P.M., Dr. Knyvett Gordon: The Diagnosis and Treatment of Acute Bacterial Infections, illustrated by epidiascope, and followed by a laboratory demonstration.—Royal Northern Hospital, Holloway-road, N. Tues., 3 P.M., Demonstration of Surgical Cases by Mr. McNeill Love. No fee for attendance.—City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E. Thur., 2 P.M., Demonstration in O.P. Department by Dr. Burton Wood. No fee for attendance.—Children Clinic and Other Hospitals. A Course of Diseases of Children, lectures and demonstrations. Second week.—Hospital for Tropical Diseases, Gordon-street, W.C. Second week of Course in Tropical Medicine, all day.—Royal Waterloo Hospital, Waterloo-road, S.E. Wed., at 4.30 P.M., Lecture by Dr. Slot on Recent Advances in Treatment of Gastro-intestinal Disease.—Royal Albert Dock (Seamen's Hospital Society), Greenwich. Course of demonstrations on Fractures, Tues. and Fri., Mr. Ernest Griffiths; Wed., Mr. Hope Carlton: time 4.30 P.M.—National Hospital for Diseases of Heart, Westmoreland-street, W. Intensive Course in Cardiology for two weeks.—Prince of Wales's Hospital, Tottenham, N. Intensive Course in Medicine, Surgery, and Specialties. Two weeks.—Further particulars from Fellowship *of* Medicine.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

Monday, June 22nd.—10 A.M., Gynæcological Ward Visit, Genito-Urinary Operations, Skin Department. 11 A.M., Surgical Ward Visit. 2 P.M., Surgical Ward Visit. Medical, Surgical, Eye, Gynæcological Out-patients.

Tuesday.—9.30 A.M., Operations. 10 A.M., Medical Ward Visit, Dental Department. 11 A.M., Throat Operations. 11.30 A.M., Surgical Clinical Demonstrations. 2 P.M., Medical, Surgical, Throat Out-patients, Operations, Medical Ward Visit.

Wednesday.—10 A.M., Medical Ward Visit, Children's Medical Out-patients. 2 P.M., Medical, Surgical, and Eye Out-patients, Gynæcological Operations. 4.45 P.M., Venereal Diseases.

Thursday.—10 A.M., Neurological Department. 11.30 A.M., Treatment of Fractures. 2 P.M., Medical, Surgical, and Eye Out-patients, Genito-Urinary Department. Operations.

Friday.—10 A.M., Medical Ward Visit, Skin and Dental Departments. 12 noon, Medical Lecture. 2 P.M., Medical, Surgical, and Throat Out-patients. Operations.

Saturday.—9 A.M., Throat Operations. 10 A.M., Medical Ward Visit, Surgical and Children's Medical Out-patients.

NATIONAL HOSPITAL, Queen-square, W.C.

Monday, June 22nd.—12 noon, Dr. Greenfield: The Cerebro-spinal Fluid. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Mr. Symonds: Minor Mental Disorders.

Tuesday.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Martin: Von Recklinghausen's Disease.

Wednesday.—2 P.M., Dr. Martin: Out-patient Clinic.

Thursday.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Riddoch: Neurosyphilis (2).

Friday.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Collier: Muscular Atrophy.

CHARING CROSS HOSPITAL MEDICAL SCHOOL POST-GRADUATE COURSE.

Sunday, June 21st.—10.45 A.M., Mr. Norman C. Lake: Surgical Questions and Answers. 11.45 A.M., Dr. J. Russell Reynolds: Radium.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE, Keppel-street, Gower-street, W.C.

Friday, June 26th.—5 P.M., Sir Thomas Legge: Industrial Poisonings.

INSTITUTE OF PATHOLOGY AND RESEARCH, St. Mary's Hospital, W.

Tuesday, June 23rd.—5 P.M., Prof. Hamilton Hartridge: The Theory of Hearing.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

Tuesday, June 23rd.—3.15 P.M. (at the Royal Chest Hospital), Dr. Saxby Willis: Artificial Pneumothorax (Illustrated by cinema film).

HOSPITAL FOR EPILEPSY AND PARALYSIS, Maida Vale, W.

Thursday, June 25th.—3 P.M., Dr. Douglas McAlpine will demonstrate to Registered Practitioners.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, Balham, S.W.

Wednesday, June 24th.—4 P.M., Dr. Macdonald Critchley: Migraine.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY, 49, Leicester-square, W.C.

Wednesday, June 24th.—Annual general meeting. Clinical Cases.

NATIONAL ASSOCIATION FOR PREVENTION OF TUBERCULOSIS.

Thursday, June 25th, to Saturday.—(At Margate): Annual conference. Discussions on the Protection of the Child from Tuberculosis.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.

Friday, June 26th.—4 P.M., Mr. Gill-Carey: Operative Treatment of Sinusitis.

UNIVERSITY OF BIRMINGHAM.

Tuesday, June 23rd.—3.30 P.M. (at the General Hospital). Dr. T. L. Hardy: Colon Spasm and Colitis.

Wednesday.—4 P.M. (in the Large Theatre of the Medical Faculty, Edmund-street), Sir Hubert Bond: Some Correlations between General and Psychological Medicine. (Last Lecture.)

Friday (at the Queen's Hospital).—3.30 P.M., Dr. Cyril Maguire: Demonstrations of Medical Cases.

Appointments

Allen, Dorothy, L.R.C.P. & S. Edin., L.R.F.P.S. Glasg., has been appointed Asst. Medical Officer of Health, Barrow-in-Furness.

Craig, J. C. B., M.D., Ch.B. Edin., D.P.H., Asst. Medical Officer of Health, Carlisle.

Frazer, W. M., M.D., Ch.B. Liverp., D.P.H., Medical Officer of Health, Liverpool.

Sheffield Royal Infirmary: Platt, R., M.D., Ch.B. Sheff., Hon. Asst. Physician; Fawcett, A. W., M.B., Ch.B. Edin., F.R.C.S. Eng., Hon. Asst. Surgeon.

Certifying Surgeons under the *Factory and Workshop Acts*: Worsley, R. C., L.R.C.P. Lond., M.R.C.S. (Mitcheldean, Gloucester); Forsyth, J. M., M.B., Ch.B. Glasg. (Farnborough (No. 1) District); Gibson, G. M., M.B., Ch.B. Edin. (Cromarty, Ross and Cromarty).

Vacancies

For further information refer to the advertisement columns.

Aberdeen County.—Asst. M.O.H. £500.

All Saints' Hospital for Genito-Urinary Disease, 91, Finchley-road, N.W.—H.S. At rate of £150.

Barnsley, Beckett Hospital and Dispensary.—H.P. £200. Also Cas. O. £250.

Birmingham and Midland Eye Hospital.—Res. Surg. O. £150.

Birmingham City Babies' Hospital.—Res. M.O. At rate of £100.

Birmingham, Midland Hospital, Easy-row.—H.S. £150.

Birmingham University.—Walter Myers Travelling Scholarship. £300.

Blackburn Royal Infirmary.—Fourth H.S. £150.

Bolingbroke Hospital, Wandsworth Common, S.W.—H.P. At rate of £120.

Bolton Infirmary and Dispenary.—Two H.S.'s. Each £150.

Bradford Royal Eye and Ear Hospital.—Jun. H.S. £150.

Brighton Poor-law Institution.—Res. M.O. £850. Also Res. Sen. Asst. M.O. £400. And Visiting Surg. Spec. £325.

Bristol General Hospital.—Two H.P.'s, Two H.S.'s, Res. Obstet. O., and H.S. to Spec. Depts. All at rate of £80. Also Cas. H.S. At rate of £100.

Brookfield Orthopædic Hospital, Hale End, Woodford Green.—Anæsthetist.

Bury St. Edmunds, West Suffolk General Hospital.—H.P. and Obstet. O. £150.

Canterbury, Kent and Canterbury Hospital.—H.P. and H.S. Each at rate of £125.

Cardiff, Welsh National School of Medicine.—Jun. Asst. in the Medical Unit. £300.

Central London Ophthalmic Hospital, Judd-street, W.C.—Sen. and Jun. H.S. £120 and £100 respectively.

Central London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C.—Third Res. H.S. At rate of £75.

Coborn School for Girls, 29–33, Bow-road, E.—Doctor. £50.

Connaught Hospital, Walthamstow, E.—Res. H.P. At rate of £100.

Coventry, Coventry and Warwickshire Hospital.—Res. Cas. O. £125.

Derby, Derbyshire Royal Infirmary.—Ophth. H.S. £150.

Dudley, Guest Hospital.—Two H.S.'s. £160–£170.

Durham County Hospital.—H.S. £150.

Eastbourne, Princess Alice Memorial Hospital.—H.S. At rate of £150.

East Lothian, South-Eastern Counties of Scotland Joint Sanatorium, East Fortune.—Asst. M.O. £250.

Elizabeth Garrett Anderson Hospital, Euston-road.—Asst. Radiologist. £100. Also 2nd H.S., and Obstet. Asst. Each at rate of £50.

Evelina Hospital for Children, Southwark, S.E.—Cas. and Out-Patient Officer. At rate of £120.

Exeter, Royal Devon and Exeter Hospital.—H.P. and H.S. to Special Depts. Each at rate of £150.

Folkestone, Royal Victoria Hospital.—Sen. and Jun. Res. M.O.'s. At rate of £125 and £100 respectively.

Gloucester, Gloucestershire Royal Infirmary, &c.—H.S. At rate of £120.

Grimsby and District Hospital.—Res. M.O. £200.

Grosvenor Hospital for Women, Vincent-sq., S.W.—Res. M.O. At rate of £100.

Hampstead General and N.W. London Hospital, Haverstock-hill, N.W.—H.S. and H.P. Each at rate of £100.

Hertford County Hospital.—H.S. At rate of £200.

Hospital for Sick Children, Great Ormond-street, W.C.—Part-time Jun. Cas. O. At rate of £150.

Hove Hospital, Sackville-road.—Res. M.O. £150.

Hull Royal Infirmary.—3rd H.S. At rate of £150.

Indian Medical Service.—Commissions.

Inverness, Royal Northern Infirmary.—Two H.S.'s. Each at rate of £100.

Ipswich, East Suffolk and Ipswich Hospital.—Cas. O. £120.

Islington Institution, St. John's-road, N.—Temp. Asst. M.O. At rate of £600.

Jewish Health Organisation, 19, Dorset-square, N.W.—Hon. Asst. Psychiatrist.

King's College Hospital, Denmark Hill, S.E.—Jun. Ophth. Surgeon.

King's Lynn, West Norfolk and King's Lynn General Hospital.—H.P. At rate of £125.

Leeds, Herzl Moser Hospital.—R.M.O. £200.

Liverpool, Alder Hey Children's Hospital, West Derby.—Sen. Asst. Res. M.O. £400.

Liverpool, Smithdown-road Hospital.—Res. Asst. M.O. £200.

London Hospital, E.—First Asst. and Reg. to Children's Dept. £300.

London Jewish Hospital, Stepney Green, E.—Asst. Gynæcologist.

London University.—Examinerships.

Longton Hospital, Staffordshire.—H.S. £120.

Manchester Royal Infirmary.—H.S. At rate of £100–£200. Also Res. Surg. Reg. to Out-patients. At rate of £150.

Mildmay Mission Hospital, Austin-street, Bethnal Green, E.—Jun. Res. M.O. At rate of £100.

National Hospital, Queen-square, W.C.—Hon. Asst. Radiologist. Also Registrar and Res. M.O. Each £200.

National Hospital for Diseases of Heart, Westmoreland-street, W.—Pathologist. £250.

Newcastle General Hospital.—Two H.P.'s and Three H.S.'s. All at rate of £100.

Newcastle-upon-Tyne, Royal Victoria Infirmary.—Two Res. Anæsthetists. Each at rate of £300.

Newport, Mon., Royal Gwent Hospital.—Jun. Res. M.O. £136.

Norwich City.—Asst. M.O.H., &c. £500.

Nottingham City Mental Hospital.—Jun. Asst. M.O. £350–£400.

Nottingham General Hospital.—H.S. At rate of £150. Also Casualty Officer. At rate of £200.

Oldham Royal Infirmary.—H.P. and Cas. O. Each at rate of £175.

Paddington Green Children's Hospital, W.—Hon. Surgeon to Ear, Nose, and Throat Dept.

Plymouth Central Hospital.—H.S. At rate of £150.

Plymouth, City Hospital.—Radiographer. £240–£280.

Portsmouth City.—Deputy M.O.H. £720.

Queen Mary's Hospital for the East End, E.—H.P., H.S. Also H.P. and Res. Anæsthetist. Each at rate of £120.

Queen's Hospital for Children, Hackney-road, E.—H.S. At rate of £100. Two Anæsthetists. Each £25. Also Res. M.O. £200.

Reading, Royal Berkshire Hospital.—H.P. and Res. Anæsthetist. £150.

Rochester, St. Bartholomew's Hospital.—H.P. At rate of £175.

Rotherham Hospital.—Cas. H.S. £150.

Rotherham, Oakwood Hall Sanatorium.—Asst. M.O. £300.

Royal Free Hospital, Gray's Inn-road, W.C.—Unit Anæsthetist. £150. Also Clin. Assistantships to Spec. Depts.

Royal National Orthopædic Hospital, 234, Gt. Portland-street, W.—Asst. Reg. Surg. for Country Branch. Stanmore. £350.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Cas. O. £200. Also H.S. At rate of £100.

St. Alfege's Hospital, Vanbrugh-hill, Greenwich.—Asst. M.O. At rate of £250.

St. Leonard's-on-Sea, Buchanan Hospital.—Jun. H.S. At rate of £125.

St. Mary's Hospital Medical School, W.—Asst. Director to Surgical Unit.

St. Thomas's Hospital.—Two Surgical Registrars. Also Asst. in Dept. of Psychological Medicine.

Samaritan Free Hospital for Women, Marylebone-road, N.W.—Registrar. £130.

Sheffield Children's Hospital.—Whole-time Registrar-Pathologist. £350. Also 3rd Res. M.O. At rate of £80.

Sheffield, Nether Edge Hospital.—Asst. M.O. £350.

Sheffield Royal Infirmary.—H.S., Ophth. H.S., Asst. Aural and Ophth. H.S. Each at rate of £80.

Stourbridge, Corbett Hospital.—Res. H.S. At rate of £200.

Swansea General and Eye Hospital.—H.P. £150.

Walsall General Hospital.—H.S. At rate of £150.

West End Hospital for Nervous Diseases, Gloucester-gate, Regent's Park, N.W.—Jun. H.P. At rate of £100.

Wolverhampton County Borough.—Asst. M.O. £550.

Wolverhampton Royal Hospital.—H.S. At rate of £100.

Woolwich and District War Memorial Hospital, Shooters Hill, S.E.—H.P. At rate of £100.

The Chief Inspector of Factories announces a vacant appointment for a Certifying Factory Surgeon at Golspie (Sutherland).

Births, Marriages, and Deaths

BIRTHS.

IRWIN.—On June 5th, at Devonshire-street, W., the wife of W. K. Irwin, M.D., F.R.C.S., of a son (prematurely).

STRONACH.—On June 10th, at Nottingham, Marjorie, the wife of Ian D. Stronach, F.R.C.S. Ed., Mansfield, of a son.

MARRIAGES.

DAVIES—MCCALDIN.—On June 11th, at the Presbyterian Church, Monaghan, Ireland, John Llewellyn Davies, F.R.C.S., Wellington Circus, Nottingham, to Dorothy Grace, eldest daughter of Mr. W. A. McCaldin, Glenview, Monaghan.

HEWETSON—GODSON.—On June 10th, at the Parish Church, Cheadle, Cheshire, James Charlesworth Hewetson, M.B., B.S., to Enid Frances Entwistle, youngest daughter of Dr. and Mrs. J. H. Godson, of Cheadle, Cheshire.

SATCHWELL—WEIR.—On June 8th, at the Parish Church, Milford Haven, Thomas Allen Satchwell, L.D.S., to Sidney Marion Weir, B.A., L.D.S.

STARLING—CRACKNELL.—On June 13th, at St. Paul's, Rusthall, Dr. E. C. W. Starling, to Nancy Cracknell, daughter of Mr. and Mrs. Cracknell, of Tunbridge Wells.

WELLISH—MANNERS.—On June 11th, at St. James's Church, Riddlesdown, Gilbert Charrington Wellish, F.R.C.S., of Croydon, to Edith, widow of Mr. Ramsay Manners.

DEATHS.

BRAITHWAITE.—On June 8th, Edward Ashe Braithwaite, M.B., C.M. Edin., J.P., of West Croft, Egremont, Cumberland, in his 64th year.

BROOKMAN.—On June 12th, Hubert Brookman, M.R.C.S., L.R.C.P., D.P.H., of Woodside Park-road, North Finchley, N., and late of Potters Bar, aged 36.

FERGUSON.—On June 8th, at the West London Hospital, Andrew James Ferguson, M.A., M.B., Ch.B., of Holland-road, Kensington, W., aged 44.

GRANT.—On June 11th, at Willesden Hospital, Charles Hamilton Russell Grant, L.D.S. R.C.S. Eng., of Cuckoo-hill, Lodge, Eastcote, aged 50.

MACFIE.—On June 9th, at a London nursing home, Ronald Campbell Macfie, M.A., M.B., C.M., LL.D.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

GLASGOW ROYAL MENTAL HOSPITAL.—Permission has been given for the name of the Glasgow Royal Asylum for Lunatics to be changed to "The Glasgow Royal Mental Hospital."

is taken and charted on a twice-daily chart at approximately the same hours each day. A half-minute thermometer is used and is left in the mouth for two minutes.

May I beg for insistence by all practitioners that the nurse in private practice shall keep charts? Too often have I been called into consultation on a difficult case to find that the nurse has given up the "silly habit" of keeping charts, years ago!

The morbidity figures for the first three years of my mastership are given below, but in view of the increasing number of complicated cases which seek admission, I have little hope of sustaining these figures. During this period there were 250 cases morbid according to the B.M.A. standard already mentioned. As there were 6075 deliveries in the intern maternity during the time, the percentage rate is 4·1. Of these 250 cases, 128 were operative deliveries, 81 were due to extra-genital causes, and 41 were ordinary cases. That is, 50·1 per cent. of the morbidities were in cases which required some manipulation, while 16·4 per cent. were natural deliveries; surely an argument against interference except when absolutely necessary. Taking the three years together, the greatest number occurred in the three months January, February, March, when the number was 85 of the 250. Taking all in all, there is little to be ascertained as to seasonal activity of sepsis. The following Table shows the numbers in the different months.

Nov.	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.
10	7	15	11	16	10	10	7	12	9	6	11
8	6	8	9	6	8	6	3	3	4	6	2
2	4	9	8	3	4	5	1	2	9	3	7
20	17	32	28	25	22	21	11	17	22	15	20

Total 250 in 6075 deliveries—i.e., 4·1 per cent.
Of these there were 128 operative deliveries, 50·1 per cent.
" " " 41 non-operative " 16·4 " "

The Private or Hospital Patient.

In considering this whole question, are we dealing with the patient with complete theatre equipment in hospital or in the slum dwelling? Are we catering for the patient in her private house or in the private home? The answer is that it is the duty of those who have control of institutions, and who are teaching post-graduates, to prepare them for every emergency. This has been the object at the Rotunda for many years, and in attaining our results it must be remembered that, unlike some institutions, there is much teaching given to post-graduates, undergraduates, and nurses, and that this necessarily entails added manipulation; in comparing statistics of one institution with another, these facts must be borne in mind. We endeavour to work out a line of treatment which can be carried out in any surroundings.

I do not believe in teaching my students that a midwifery case must be conducted like a surgical operation; this is a catchword spoken by those who cannot realise the difficulties of practice. It is an expression more from the mouth of the gynæcologist than from that of the obstetrician. It is important for the general practitioner, when he requires a consultant on midwifery, to find out if the latter is really a practising obstetrician. I shall probably be castigated as retrograde, unsurgical, and unsound, but in spite of these hard words I refuse to be classified as unobstetrical.

Instruction in Puberty and at Marriage.

Instruction at puberty is all-important for the future mother. A girl should be taught about the onset of menstruation and, according to recent investigations, she should be taught that a healthy body and mind are best obtained by continuing with normal life—games, dancing, and work—during the menstrual period. At marriage there should be knowledge both of the sex act and of sexual relations in general. Especially should it be pointed out that contraception in early marriage is inadvisable. I have been consulted over and over again by women who are anxious to be cured of sterility and who have practised contraception for two or three years. They do not know whether this practice has caused sterility (probably by blocking the tubes through an ascending infection from the vagina) or whether sterility would have occurred in any case. It must also be remembered that contraceptives of certain types may cause an infection which may further cause trouble in labour.

CARE OF PATIENT IN PREGNANCY.

It is all-important that the patient should have a favourable outlook on life. The gloomy forebodings of the pessimist, the growls of the angry or worried husband, the startling tales of abnormal labours by nurses and so-called friends, should have no place in the prenatal armamentarium. I am convinced that depression of any kind lessens resistance, and I have always urged pleasant people and surroundings, with peace of mind, for my pregnant patients.

Fresh air should be insisted on. Daily baths at a temperature of 100° F. should be taken. Coition should be moderate and should not take place, in a normal case, during the last month; if there is any history of abortion it is wiser to avoid it altogether. The word constipation suggests infection; rheumatism is well known to be caused through it. Surely it may be ætiological in sepsis; laxatives and suitable diet must be ordered. Anæmia, too, lessens resistance; if the ordinary organic or inorganic iron, orally administered, is unsuccessful, injections of iron and arsenic should be given. Sepsis and anæmia are boon companions. Various bacteria have been blamed for the toxæmias, so that it is obvious that bacteria are present. In our experience, a mild "sapræmia" is not a rare occurrence in the puerperium of a toxæmic patient. In addition, all debilitating diseases will lower resistance. Gonorrhœa is a definite danger; if the discharge is heavy in pregnancy, antiseptic vaginal douches should be given. In labour complicated by gonorrhœal discharge there should be no manipulation, such as vaginal examination or forceps application, unless the necessity is absolutely imperative.

CARE OF PATIENT IN LABOUR.

Every detail is important. When we remember the excellent results we obtained before the present labour ward was built—results nearly as good as those of the present day, and better than many of the years immediately after the closing of the old labour ward—we believe all the more in our ideas that the doctor and the nurse are the chief factors in obtaining good results.

Excellent results were obtained by keeping all bowls and basins in 1 in 40 carbolic acid, but I have adopted the boiling method as a step in the right direction. Needless to add, a thorough scrubbing and disinfecting has been and always is carried out immediately after use. The gloves are boiled. Dry sterilisation may be better, but the ordinary general practitioner will have no access to an autoclave and he must learn how to boil and how to put on wet gloves in a thoroughly safe manner.

The attendant should wash his hands and wear gloves, but need not wear a mask or a sterile gown. The hands are washed for four minutes with a boiled nail-brush, clean soap, and hot water. The soap is then removed and the hands steeped for one and a half minutes in 1/1000 solution of biniodide of mercury. We do not use sterile water; this is unnecessary, for all general practitioners cannot get supplies of sterile water for washing hands, and certainly we find the water-supply from the Vartry river absolutely safe and reliable. Gloves are always worn and we take much trouble to teach students how to put them on. We have seen so-called trained surgeons who were quite unable to put on gloves cleanly. A long rubber apron is worn, and the hands are kept sacred and clean.

No masks or gowns are worn or advised in a normal case. I am absolutely convinced of the wisdom of this teaching. The man who wears a mask will breathe on it; he may then handle the mask, after which he continues with his obstetrical manipulations. Even if he wears a non-sterile mask he will be more inclined to concentrate on it than to keep his hands clean. When is a man in a private house to put on his gown? How is he to protect it from being soiled? Too often I have seen the gown rubbing unwittingly against some article of furniture; then the "surgeon" allows his glove to become contaminated by the dirty gown, later giving sepsis to the patient. I do not mean to decry the teachers' wish for the sterile gown, but I do not believe it possible to teach their safe usage to the future general practitioner. I advise the gown in operative midwifery, but often the forceps are applied without a gown being worn, simply to show the student that a safe job can be done without it, and that his hands are the really sacred and untouchable part of him which must only be used for the purpose for which he is present—the actual labour.

I have tried various forms of Kocher's sheets and have given them all up. All normal deliveries are carried out in the left lateral position, where a thorough observation can be made and whereby no soiling by bowel matter can occur. If dressings are applied they are inclined to shift to and from the anus with consequent contamination; if the perineum tears, they are in the way. I have given up all dressings on the vulva at normal deliveries, and am satisfied that a cleaner labour results.

THROATS.

It has been the custom to blame the throat where no other cause of sepsis could be found. B. P. Watson, in his extremely interesting and straightforward paper, describes how he could find no other cause for a terrible outbreak. Obstetricians in England delight in proving or disproving the contention. Dr. F. S. Bourke, pathologist to the hospital, assisted by Dr. H. E. Canter—one of our post-graduates—examined swabs and took material for culture from 50 throats. The following list, showing the result obtained, was taken haphazard, with the exception of No. 13, who had a septic throat and was off duty. Are Dublin throats different from others? Is it not strange that there were no hæmolytic streptococci in the 50 throats examined? Does not this examination bear out the futility of counting on the wearing of masks as a real bar to the occurrence of sepsis? In addition it must be remarked that my four assistants and I all harboured some bacteria; yet there was no outbreak of sepsis! And, further, since the investigation one of my assistants has had a pure streptococcus infection with pus exuding from his throat, and still the patients were unaffected.

Sterile	10
Hæmolytic staphylococci and non-hæmolytic streptococci	5
Staphylococcus aureus and *Micrococcus catarrhalis*	2
S. aureus	13
S. albus	1
Hæmolytic *S. aureus*	3
Gram-negative and positive cocci and bacilli	1
S. aureus and *M. tetragenus*	1
Gram-negative and positive cocci and bacilli	1
Gram-negative bacilli and streptococci	1
S. albus and Gram-negative bacilli	1
S. aureus, streptococci, and Gram-negative bacilli	1
Hæmolytic and non-hæmolytic streptococci—	
Staphylococci	1
Contaminated	8

Let this effort cease, and let us concentrate on clear issues. Let those who wish to wear masks do so, provided they are not regarded as a fetish, but only as a very small and possibly necessary link in the chain to be forged for the prevention of sepsis.

FURTHER CARE OF THE PATIENT IN LABOUR.

A hot bath should always be given. In Dublin, the Vartry water is so clean that there is no need to prevent the water from entering the vagina. The trellis arrangement in the bath is not used; the same applies to the shower and needle bath. An ordinary reclining bath is the rule, and is of great advantage to the patient; she takes it after the enema, when she enters hospital. She is then shaved.

Just as the psychological aspect in pregnancy is all-important, so it is in labour. Resistance should be sustained by encouragement, and this is all the more necessary in a lengthy labour. Diagnosis must be made with care. An early diagnosis of abnormal presentation may prevent serious trouble later, and diagnosis should be made nearly entirely by palpation and rectal examination. A knowledge of the mechanism of normal labour is essential for a knowledge of the abnormal; it is important therefore that progress should be noted. With a knowledge of the mechanism of normal labour, failed forceps will be a thing of the past. Post-graduates should be instructed and should be given opportunities to watch normal labour. Credit should be given to the student who describes the normal labours he has seen. This is all far more important than the advanced lectures given in some institutions to post-graduate classes.

Vaginal examinations should be made seldom, but if there is doubt in the mind of the attendant about the presentation, a vaginal examination should certainly be made, and if this does not give the desired information, the half or whole hand should be passed under an anæsthetic. This is rarely necessary; in fact, vaginal examination should scarcely ever be made.

While I am an ardent supporter of the lower segment Cæsarean section after trial of labour, I also recommend the classical section for the clean patient who will quite certainly not be able to deliver herself, and thus prevent morbidity. Any instrumental or internal manipulative delivery tends to increase morbidity; a study of the records of all maternity hospitals confirms this point. Should forceps ever be applied? The percentage rate of forceps application at the Rotunda varies from 6 to 6·5, and these figures include all forceps cases—i.e., they include delivery of moribund patients and many pre-labour morbid cases. We preach from the housetops: no application until all conditions are fulfilled, but in spite of this we sometimes, when fœtal distress occurs, apply while the head is in the mid-strait. The danger of the "drag through" is extreme. I am in absolute agreement with those writers who regard a vaginal trauma as the most likely cause of sepsis, and no matter how carefully the vagina is ironed, and how slowly the delivery is accomplished, the application of forceps other than in the lower strait is attended by an increased morbidity and by some mortality.

We do not teach the use of the Kielland forceps; we are not a radical school except in our ideas of caution. We believe it is iniquitous to teach a method, that may be used with success by a skilled obstetrician, to general practitioners who will neither have the time nor the knowledge to acquire skill in its use. We have already seen at the Rotunda many examples of the misuse of this instrument outside.

After the birth it is obviously of the greatest importance to separate the vulva and look carefully for inside as well as outside tears.

While douching before instrumental labour is the rule, the douche is not used in the normal labour, nor in the puerperium. There has been a vogue lately to teach that secondary repairs should be performed at the *termination* of labour. We believe that this is a dangerous teaching. Imagine a practitioner in a private house starting to do a trachelorrhaphy for a cervical tear sustained in a previous confinement. If this is done maternal mortality will certainly increase.

In every case which is at all suspicious—i.e., where examinations have been made outside the hospital, where manipulations in the hospital have been extensive, especially those causing pain or where there is a questionable discharge—20 c.cm. of antistreptococcal serum is given, and the uterus is activated in the puerperium by the administration of ergotinin phosphate or ergotamine tartrate and quinine grs. 5 three times a day. If the vagina has been traumatised, tincture of iodine 2 per cent. mercurochrome or brilliant green is poured in. Other drugs have been suggested for this purpose, but I think that too much reliance should not be placed on any of them.

The Puerperium.

Immediately after a labour where there has been retention of membranes, the patient is ordered a routine dose of ergot and quinine three times daily. In suspicious cases antistreptococcal serum, 20 c.cm., and quinine, grs. 7½, are given as a prophylactic. Insistence on free movement is the rule and on the appearance of fetid lochia, rising from bed for five minutes twice daily is ordered.

In hospital the hours of the nurses are arranged so that one nurse washes up her patient. Most important of all is the arrangement of numbering the bed-pans, wash-up pans, and bed. Each bed has its own set of utensils. The following are required: (1) cup or small bowl in which to place the pad; (2) small enamel plate for the soap; (3) kidney tray to receive the soiled pad and swabs; (4) douche pan; (5) douche basin; (6) scrubbed bowl in dish of disinfectant; (7) forceps. The bowl, plate, kidney tray, and forceps are sterilised by boiling for 20 minutes. The douche pan and basin are scrubbed with weak cyllin with a nail-brush, and rinsed with warm water. We do not believe it is necessary to boil the douche pan; we must teach our nurses to learn to be as clean as possible in the cottage. The "wash-ups" are done at 7.30 A.M. and 7.30 P.M. Finally, in removing stitches, great care must be taken to clean the perineum properly, or else septic material will be drawn through the tissues. I have seen a sudden septicæmia arise from carelessness in this respect.

Isolation.

Maternity hospitals are being built and altered in the effort to combat maternal mortality, and extravagant notions have been circulated about the necessity for numerous wards. Primarily, it must be stated that all suspect cases must be isolated. This has been the custom at the Rotunda for scores of years, and it is nearly amusing to think that people are still questioning this absolutely necessary aspect of security. Isolation has been the custom, and it has been practised without frills or embroidery. In designing a labour department, one ward where suspect cases can be delivered is a necessity. Wards for puerperal suspect cases are just as necessary. Following the preliminary investigation after admission, the suspect is sent to an isolation ward with a special nurse, and there she is delivered. Small isolation pre-labour wards are better than large. After the birth, the *patient is transferred* to the small puerperal isolation ward, where she is attended by a special nurse. The segregation of suspect cases is a necessity. As for the pre-labour case, so for the puerperal: small wards are better than one large ward, for then the gonorrhœal case can be separated from the tubercular, the septic abortion, the puerperal streptococcic, and from any other infective case of unknown origin.

In the puerperium, immediately a rise of temperature is discovered, the patient is isolated; she may be well in 24 hours, but if she is not isolated, the ward and even the hospital may become a seething nidus for the bacteria which abound. Thus will hospitalisation become condemned, and thus will patients be advised to remain in their own homes—a pernicious habit.

Conclusions.

1. Prenatal care, though important, must not mask the fact that complications of labour will occur in spite of it.

2. There is *a cure for all cases* of sepsis. It is a mistake to concentrate on one method of treatment. The difficulty is to discover the treatment suitable for the case.

3. In a questionaire to a small number of patients who had been morbid in the puerperium, the complaints were found to be surprisingly small; 58 per cent. became pregnant soon afterwards.

4. There should be an international standard of morbidity. At least there should be a national standard. It is suggested that the British College of Obstetricians should give judgment on this.

5. At the Rotunda there were 250 morbid cases in 6075 deliveries, i.e., 4·1 per cent.; of these 50·1 were operative cases.

6. Meddlesome midwifery should be avoided when possible.

7. Figures of hospitals where teaching is not done should be better than those where there is much instruction given.

8. Teaching of post-graduates in hospital should prepare them for general practice, not for work in palatial surroundings.

9. Sepsis can be prevented by care in pregnancy.

10. The obstetrician must know how to put on gloves.

11. It is necessary to wear gloves at all midwifery cases. The wearing of masks and gowns is not essential.

12. Details are given of the examination of 50 throats, which negatives the theory that throats are responsible for sepsis.

13. Aseptic dressings around the vulva are more inclined to be a danger than a preventive.

14. While forceps may be used, such procedures as the delivery of a head in the superior strait by the Kielland or any other forceps is condemned.

15. Small isolation wards for suspect cases in pregnancy, labour, and the puerperium are necessary.

It is a well-known fact that the quickest and safest way to climb a mountain is not to take short cuts, so the best method of combating the scourge of sepsis is not by complicated manœuvres or by working in operating theatres. Success will be achieved, apart from the methods outlined in my paper, by (1) the better education of the student and nurse in hospitals where there is a sufficient amount of material available, (2) by increasing post-graduate facilities for both, and finally, by propaganda with pregnant women themselves.

I have already suggested that doctors and nurses holding public appointments should have compulsory post-graduate training, which should not be included in their leave, the expense of which should be paid for out of the rates.

DIPHTHERITIC HYPOPIESIA.

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Towards the end of the first fortnight in diphtheria a clinical condition develops which may be fatal, and which is clearly separable from early cardiac failure. The chief feature is an extremely low blood pressure, an exaggeration of the fall which occurs in all grades. This extreme diphtheritic hypopiesia has hitherto been confused with early cardiac failure. The syndrome to which it gives rise bears a close resemblance to that of extreme myocardial damage yet is clearly distinct from it. The mode and time of onset of the two conditions differ: early cardiac failure may occur in cases of varying severity; extreme diphtheritic hypopiesia occurs only in the most severe variety of diphtheria. In my series of cases I found that these two conditions accounted for about 50 per cent. of the deaths in the first three weeks of the disease, so that each is of equal importance as a fatal complication.

In support of this differentiation a study has been made of the blood pressure in all degrees of faucial diphtheria, and the main features in relation to severity have been ascertained. The evidence obtained in this way serves to corroborate the clinical evidence in making the distinction.

CLASSIFICATION OF FAUCIAL DIPHTHERIA.

It has been considered desirable for the purposes of this investigation that the cases of faucial diphtheria should be classified into degrees of severity at the outset. In this way the features of the hypopietic curve can best be considered in relation to the presumed absorption of diphtherial toxin. The patients have been arranged into five arbitrary groups and the clinical signs and symptoms determining each are set forth below. The clinical features have been given an order which my experience has led me to believe to be of the most importance in gauging the degree of severity. For example, the presence of an extreme degree of glandular swelling in the neck amounting to "bull-neck" would be an important indication of severity and, in conjunction with other symptoms, would lead to a classification of "severe." The absence of any "pain response" during the administration of the antitoxin denotes in my opinion a severe degree of toxæmia, and those cases in which the needle may be inserted painlessly, as into a pat of butter, I find usually of the severer variety. It is, however, of the greatest importance in gauging the degree of severity to consider the case in all its details, and one or two symptoms alone have not been relied upon for classification. An extreme amount of hæmorrhagic membrane is important, but this alone would not warrant the classification of "severe$_1$" if the patient had an excellent pain response and no nasal discharge nor fœtor. Similarly, membrane might be absent (having separated) and yet other symptoms determine the classification of, say, "severe$_2$."

The following are the groups :—

Severe$_1$.—(1) Bull-neck extreme; (2) membrane extensive (over soft palate), thick and hæmorrhagic; (3) no pain response; (4) marked fœtor—may be extreme; (5) ichorous nasal discharge; (6) late case, fourth, fifth, sixth days; (7) early palatal palsy (first week); (8) toxic appearance; (9) albumin in fair amount in the urine—i.e., a cloud on boiling; (10) temperature low (only in very late cases.)

Severe$_2$.—The symptoms and signs of "severe$_1$" in lesser degree or with some absent. The patient is not "in extremis."

Severe$_3$.—(1) Glandular swellings present in the neck; (2) membrane thick and may be extending on to the palate—it is usually hæmorrhagic; (3) little or no pain response; (4) fœtor present but not extreme; (5) beginning to be toxic in appearance; (6) third or fourth day cases, possibly second if great virulence; (7) albumin in urine; (8) nasal discharge not usually present; (9) early palatal palsy does not usually occur.

Medium.—These are third day cases without glandular swelling and in which the membrane is still confined to the tonsils. They are not toxic in appearance and there is usually a good pain response. Fœtor is absent or very slight; there is no nasal discharge and usually no more than a faint trace of albumin in the urine.

Mild.—First or second day cases without any additional signs of severity.

Hypopiesia and Heart Failure.

An analysis of a series of blood-pressure charts brings out the following points: 1. After a latent period there is a progressive fall followed by a rise of blood pressure in all cases of faucial diphtheria. 2. The pressure does not begin to fall below its normal level (in the absence of early cardiac failure) until the seventh day of the disease. This is irrespective of the severity. The fall most commonly begins on this day, but may be postponed until the eighth, and occasionally the ninth day. There is, in fact, a latent period of seven to nine days. 3. The curve so formed is uniform and, if allowance be made for the irregularities due to excitement, the fall and rise may be assumed to be regular. 4. In many cases the pressure during the first few days is increased above the normal. This may be due to excitement. 5. The lowest point is reached between the eighth and twelfth days. There seems to be a tendency for severe cases to reach the lowest level on the eleventh and twelfth days. 6. In the event of recovery, the normal is reached again on the twelfth to the twenty-second day of the disease. 7. The depth of the curve is in direct relationship to the severity of the disease. Thus :—

(1) Lowest points registered (average) :—

Mild	88
Medium	75
Severe$_1$	62

Severe$_2$ all died with early cardiac failure.
Severe$_3$ all died lowest figure recorded 45.

(2) The depth of the fall (average) :—

Mild	17·6
Medium	19·3
Severe$_1$	35·0

Severe$_2$ died with early cardiac failure.
Severe$_3$ died (hypopiesia), blood pressure unrecordably low at death.

Severe attacks of diphtheria may bring the patient in danger of death at any time during the first three weeks. The chief indication of such a possibility is the onset of vomiting. It has been the practice to group the majority of such occurrences under the heading of myocardial damage. This group in reality includes two different clinical conditions. I have given the name extreme diphtheritic hypopiesia to the condition which must be distinguished from early cardiac failure. The main points of difference are shown in the Table.

	Early cardiac failure.	*Extreme diphtheritic hypopiesia.*
1.	Early onset (average, sixth day).	Late onset (average eleventh day).
2.	Early fall in blood pressure coinciding with onset of symptoms.	Late fall in blood pressure, symptoms coinciding with lowest point of the curve.
3.	Sudden onset, with sudden fall of bloodpressure.	Gradual onset with gradual fall.
4.	Vomiting, with pain in chest and perhaps breathlessness.	Vomiting without pain.
5.	Breathlessness only in the attacks.	Continuous "air hunger"—e.g., sighing, attempts to sit up.
6.	Signs of myocardial damage—i.e.: Rapid pulse 120–140. Dilated heart. Irregular pulse. Apex-beat diffused. *First sound modified.* Pain in the chest.	No sign of myocardial damage—i.e.: Pulse-rate normal. Size of heart normal. No irregularity of the pulse. Apex-beat localised and firm. No modification of the first sound. No pain in the chest.
7.	Symptoms may occur when the blood pressure is still relatively high—e.g., 80 mm. of mercury.	Symptoms only when the blood pressure is very low—e.g., 55–60 mm.
8.	Restlessness only mild.	Restlessness extreme and agonising.
9.	Cold extremities.	—
10.	Subnormal temperature.	—
11.	Occurs in all severe grades.	Occurs only in the severest grade.
12.	In the event of recovery the blood pressure returns very gradually to normal over a period of weeks, with the recovery of the myocardium.	In the event of recovery the pressure is normal by the end of the third week.

It is evident that, as the depth of the fall of blood pressure increases with the severity of the attack, a very low point will be reached in the severest grades. On theoretical grounds, therefore, the severest grades might be expected to give signs of this extreme hypopiesis. The time for the occurrence of symptoms would be between the tenth and the thirteenth days, during which period the blood pressure is normally at its lowest level. In practice the severest grades do present during this period (tenth to thirteenth days) a clear-cut syndrome of restlessness, vomiting and air-hunger, which suggests very strongly that the condition under consideration is a result of extreme hypopiesis.

Representative Cases.

EXTREME HYPOPIESIS.

In the severe cases in which a marked fall of blood pressure ensues, no symptoms arise until the pressure falls to a very low level. In my cases there was a striking absence of symptoms while the systolic pressure remained above 60 mm. of mercury.

A "severe$_3$" case was a boy aged 6, a contact of two fatal cases, admitted on the second day of the disease. He had a thick hæmorrhagic membrane confined to both tonsils, slight nasal discharge, some fœtor and a slightly toxic appearance, but no glands in the neck. There was an excellent pain response, and a little albumin in the urine. He received 40,000 units of antidiphtheritic serum intramuscularly. The membrane spread during the following night in a thin layer over the palate. There was complete early palatal palsy lasting six weeks, and lower limb palsies and eye palsies in the sixth and seventh weeks.

The blood pressure began to fall on the sixth day of disease and reached 60 mm. on the tenth and eleventh days. The pulse at the lowest limit was poor and easily compressible. No symptoms occurred.

Symptoms are not, apparently, to be expected until the pressure becomes as low as 55, when there is a fall in temperature to subnormal and the extremities become cold. At the same time three symptoms arise: vomiting, restlessness, and sighing. The restlessness is persistent and agonising to watch. When once it has been seen it is difficult to forget. The child, unable to remain in any one position for more than a few moments at a time, turns this way and that, while the arms move aimlessly around in never ceasing unrest. Sighing accompanies this wearisome unrest, the child makes frequent efforts to sit up and the breathing is rapid, almost panting, so that the picture presented is one of "air-hunger." The vomiting is persistent, occurring after any nourishment by mouth, and apart from food. It is very frequent and is comparable to that seen in Addison's disease.

CASE 1.—A girl, aged 10, was admitted on the tenth day with every sign of the greatest severity. A dark hæmorrhagic membrane was protruding from the mouth which was locked by reason of the tremendous bull-neck. Fœtor was extreme and there was a blood-stained nasal discharge and extremely toxic appearance with a cloud of albumin in the urine. There was no pain response and complete early palatal palsy. She had 20,000 units of Danish State Institute (D.S.I.) serum intravenously and 40,000 intramuscularly. All the symptoms cleared up in two days, leaving the child normal in appearance.

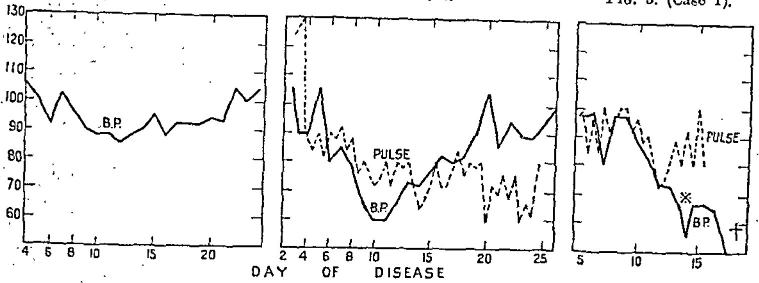
The pressure remained at 95 until the ninth day and then fell steadily to 55 on the fourteenth day (Fig. 1). For two days before this low level it remained just over 60 and the child was to all appearances making excellent progress. As the pressure reached 55, sighing, restlessness, and vomiting began. The heart was within normal limits, the pulse-rate was normal, and there was no irregularity of the rhythm. There was no cardiac pain, and the apex-beat was firm and localised. Ephedrine gr. ½ was given four-hourly and the pressure remained above 65 for three more days. On the seventeenth day the pressure again began to fall, and the last registrable reading was 45. The child lived until the beginning of the nineteenth day, 36 hours after the pulse had become impalpable and the blood pressure unregistrable. To the end there were no signs or symptoms of cardiac failure. The restlessness became more and more marked, vomiting more frequent, sighing continuous, and the extremities cold and lifeless. The child was conscious and talked to me to the end, wishing to be propped up in bed, in which position she seemed easier. She faded away, the exact time of death being difficult to determine.

CASE 2.—A boy, aged 10, was a "severe$_1$" type on the fourth day. He had a hæmorrhagic membrane over the palate and marked fœtor, bull-neck, ichorous nasal discharge, and a toxic appearance. He received 32,000 units of antidiphtheritic serum intramuscularly.

The pulse remained good and full until the ninth day of the disease, when the temperature fell to subnormal. Restlessness, sighing, and vomiting began on the tenth day. The extremities became cold and lifeless and the pulse almost impalpable. The signs of air-hunger became more and more distressing and the child died very gradually on the twelfth day. During the whole period the pulse remained regular and at normal rate. There was no cardiac pain nor dilatation of the heart. (A continuous blood-pressure chart was not kept.)

CASE 3.—A girl, aged 9, had on the fourth day a hæmorrhagic membrane to the front teeth, marked fœtor, ichorous nasal discharge, a very toxic appearance, and no pain response. Albumin was found in the urine for six weeks, and complete early palatal palsy lasted for seven weeks, and lower limb and eye palsies later. There was *ptosis* in the fifth week, and a petechial rash on the back and arms and hæmorrhagic blotches on the arms. She was given 2000 units of antidiphtheritic serum intravenously and 20,000 intramuscularly, and had ephedrine gr. ½ four-hourly

FIG. 1. FIG. 2. FIG. 3. (Case 1).

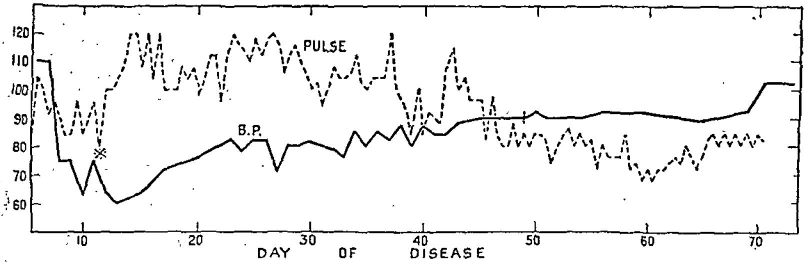


Fall of blood pressure in a mild case (Fig. 1), a severe case (Fig. 2), and a case of extreme hypopiesis (Fig. 3). In Fig. 3 the asterisk shows the time of the onset of vomiting and restlessness. Ephedrine was then given. † = time of death.

from her admission for ten days and six-hourly for a further seven days.

Restlessness, sighing, and vomiting occurred on the twelfth and thirteenth days, at which time the pulse was poor and easily compressible. Restlessness ceased on the fourteenth day. Vomiting continued occasionally until the eighteenth day, when the pulse was full and the child demanded food and began eating voraciously. She was discharged in the thirteenth week. At no time was there any indication of myocardial damage. The pulse-rate never rose above 95 and during the period of air-hunger the beat was regular between 76 and 80. The heart was always in normal limits and the apex-beat firm and localised. Recovery in this girl may have been due to the continuous administration of ephedrine. (No continuous blood-pressure record was kept.)

FIG. 4 (Case 5).



Pulse and blood pressure charts in a case of early cardiac failure. The asterisk shows the time when vomiting began with cardiac pain and breathlessness.

EARLY CARDIAC FAILURE.

As has been previously emphasised, the main features of this condition are the sudden onset at an early date, before the normal fall in blood pressure has begun; the steep fall in pressure due to the dilating myocardium; and the very definite signs of myocardial damage, of which the most important is the increase in the pulse-rate.

FIG. 5.

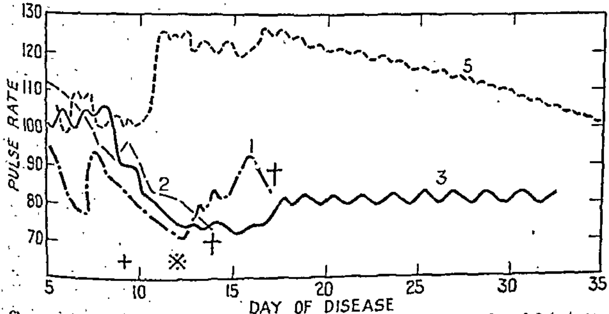


Chart showing pulse-rates in Case 5 (early cardiac failure), and Cases 1, 2, and 3 (extreme diphtheritic hypopiesia). + = the onset of vomiting and cardiac attacks in Case 5. * = onset of vomiting and air hunger in Cases 1, 2, and 3. † = death in Cases 1 and 2.

CASE 4.—A girl, aged 7, was a severe type on the third day. *She had medium* bull-neck, fœtor, a cloud of albumin in the urine, a toxic appearance, and good pain response. The membrane did not extend on to the palate.

At the time of admission (third day) the child was having frequent attacks of breathlessness with cardiac pain. The heart was enlarged, the apex-beat being 1¼ in. beyond the *nipple line, and diffuse.* The pulse-rate was 136–140. The blood pressure on admission was 68. Vomiting with cardiac pain was frequent and continued until death on the fifth day.

CASE 5.—A girl, aged 10, was a "severe$_3$" case on the third day, with a toxic appearance, good pain response, a thick membrane over the palate, fœtor, and some glands in the neck. Palatal palsy began early, lasted one week, and was followed by complete late palatal palsy lasting two months. Lower limb, accommodation and external rectus palsies appeared in the seventh week.

The pressure remained at 105 until the seventh day and fell suddenly to 75 on the eighth day (Fig. 4). The child complained of tightness in the chest and the heart enlarged. The apex-beat became diffuse, the pulse assumed a gallop rhythm, and there were attacks of cardiac pain with breathlessness and vomiting. The vomiting and cardiac pain were frequently present for two days and occasionally for the next fortnight. The heart remained enlarged for six weeks and the rhythm abnormal for eight weeks. Very gradually, as the blood pressure rose to normal during two months, the pulse-rate slowed.

COMPARISON OF PULSE-RATES IN THE TWO CONDITIONS.

No feature allowing of easy comparison is better able to show the distinction between the two conditions than the pulse-rate (Fig. 5). The following chart shows the pulse-rates of four of the cases described.

Whatever may be the cause of extreme hypopiesia, it is clear that it cannot be due to damage to the myocardium, since the enhancement of the pulse-rate which occurs as a result of damage to the myocardium is a very constant feature.

Conclusions.

1. The blood pressure in diphtheria begins to fall after the seventh day, reaches the lowest point about the twelfth day, and rises again to normal about the twentieth day.
2. This fall occurs in all grades of diphtheria.
3. The depth of the fall is in direct relationship to the severity of the attack.
4. In the severest cases the fall may be so great as to occasion a clinical condition which in many cases is fatal.
5. This condition, which occurs late, accounts for about 50 per cent. of the deaths during the first three weeks and is clearly distinguishable from the classical early cardiac failure.

I wish to express my thanks to Dr. Duncan Forbes, superintendent of the Brighton Borough Sanatorium, for allowing me to publish an acconnt of the cases referred to in this paper.

THE PLASMA CHOLESTEROL IN NEPHRITIS.

OBSERVATIONS ON A SERIES OF CASES.

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ALTHOUGH cholesterol was first isolated in 1775, little was known about it until a comparatively recent date. In the last 20 years much work has been done on the various problems connected with cholesterol as it occurs in physiological and pathological conditions. Its metabolism unfortunately is not yet fully understood and, until it is, many of these problems will remain unsolved.

Cholesterol is found in the blood in two forms: (*a*) as free cholesterol, which exists mostly in the cellular elements; and (*b*) as cholesterol combined with various fatty acids to form esters. This latter form predominates in the plasma, but free cholesterol is also present. The two forms together constitute the total cholesterol of the blood, and it is this combined value which is considered in the present work.

In numerous pathological conditions, variation in the cholesterol content of the blood occurs. Nephritis is one of the diseases which has excited most interest, and many investigations on the subject have been made. Campbell,[1] in a review of Cholesterol in Health and Disease, comments on the discrepancy in the various results recorded, especially by the earlier workers. He concludes that, on the whole, high values are likely to be found in chronic parenchymatous nephritis and to a lesser degree in chronic interstitial nephritis, and that in the latter a fall occurs with the onset of uræmia. He adds, however, that more work is necessary to determine the exact conditions in nephritis under which an increase takes place. It seemed therefore worth while to investigate a series of cases to confirm results already obtained, and to ascertain the diagnostic and prognostic significance of the cholesterol content of the blood in the various types of nephritis. To elucidate these points estimations were carried out on—

1. A series of healthy control cases.
2. A series of patients suffering from nephritis.
3. A series of patients with renal conditions other than nephritis.
4. A series of cardiac cases with œdema.

METHOD OF INVESTIGATION.

In all the nephritic and in most of the other cases, specimens of blood were taken, for convenience, just before the beginning of a urea-concentration test, so that the same sample served for the estimation of both cholesterol and other substances. In the few remaining cases where this procedure was not adopted specimens of blood were collected three to four hours after a light breakfast.

The cholesterol estimations were made on the plasma after the technique of Myers and Wardell, as modified by McAdam and Shiskin,[2] and each estimation was done in duplicate. Extraction with chloroform in a Soxhlet apparatus was allowed to proceed for three hours. The standard solution used was cholesterol in chloroform. This was found to be much more satisfactory than the solution of naphthol-green B which, it had been suggested, might replace the chloroform standard. Nevertheless, difficulty was often experienced in matching the two solutions owing to a difference in the shades of green of the standard and the unknown. The fact that this difference occurred in some estimations and not in others, while the same chloroform and reagents were in use, suggests that it is due to some difference in the plasmas. It was found that overheating at any point in the procedure or the presence of moisture lowered the readings. Where the duplicate readings were not in close agreement, the estimation was discarded.

1. *Control cases.*—A series of 17 control estimations were made, the maximum, minimum, and mean readings being 227, 138, and 170 mg. per 100 c.cm. These figures are slightly higher than those found by other workers using the same method. McAdam and Shiskin[2] found the range to lie between 191 and 133 mg., while Maxwell[3] gives maximum and minimum figures of 200 and 130 mg. Campbell takes the normal range to be 150 to 200 mg. with an average of 180 mg.

On the whole, the impression gained in this investigation is that the upper normal limit is frequently higher than the commonly accepted value of 200 mg.

2. *Nephritic cases.*—Estimations were made in 60 cases of nephritis. In some instances there was

difficulty in classification, but the following grouping was eventually adopted:

Group.	Cases.
1. Acute glomerular and tubulo-glomerular nephritis	22
2. Chronic interstitial nephritis	11
3. Arterio-sclerotic cases	9
4. Chronic parenchymatous nephritis	13
5. Mixed type of nephritis	5

The results in this series can be most conveniently recorded by giving the general findings in tabular form in the first instance, and thereafter considering the general groups in greater detail (Table I.).

TABLE I.

Group.	Cholesterol content of plasma in mg. per 100 c.cm.		
	Max.	Min.	Mean.
1. Acute nephritis	363	131	223
2. Chronic interstitial nephritis	266	141	182
3. Arterio-sclerotic cases ..	314	166	245
4. Chronic parenchymatous nephritis	408	160	259
5. Mixed type of nephritis ..	333	195	253

GROUP 1.

Acute Nephritis.

In this group there were 22 cases. The characteristic features were: (1) albuminuria, with or without hæmaturia; (2) raised blood pressure; (3) œdema; (4) headache; (5) sudden onset in an apparently healthy individual. The criterion of recovery taken was the absence of albumin from the urine.

The maximum, minimum, and mean readings for the group were 363, 131, and 223 mg. per 100 c.cm. respectively. Second estimations made before dismissal in 21 of the cases gave the following figures: maximum 274, minimum 114, and mean 186 mg. There is therefore a tendency towards a decrease in the amount of cholesterol in the plasma during recovery. The most marked example of this fall in the plasma cholesterol is seen in Case 15, where the cholesterol content decreased by 134 mg. (Table II.).

Three cases, Nos. 7, 8, and 21, showed an increase in cholesterol during convalescence. In Cases 7 and 8 the increase was slight and may possibly be explained by the fact that in both patients there was evidence of an infection. As a reduced choesterol content is found in acute infections, the ultimate rise in these cases might merely indicate a subsidence of the infective process. Case 8 made a good recovery and on examination two years later was found to be in excellent condition, while the cholesterol had fallen to 178 mg. Case 7 has unfortunately not been traced. One cannot draw conclusions from one case, but, in comparison with Cases 47, 49, 54, 55, and 59 of the parenchymatous group, it would suggest that a slight rise in the cholesterol content is not of serious significance, provided that the albuminuria is disappearing. The remaining case, No. 21, which showed a rise in cholesterol during convalescence, was uræmic on admission and had nitrogen retention in the blood. The low initial reading in this case may be associated with the uræmia, in which low values are common. The low readings in these cases have been ascribed to toxic influence, although direct proof is scanty. A certain increase in cholesterol was, therefore, to be anticipated in this case, but in point of fact the value increased to an abnormal extent. The behaviour in this respect resembles, and is probably akin to, that observed in cases of infection where a low reading in the acute stage is followed by an abnormally high reading during convalescence.[4]

With the exception of five cases to be mentioned later, all the patients had œdema in some degree, but in none was it excessive. The four cases showing the greatest œdema, Nos. 1, 7, 16, and 20, gave cholesterol values of 177, 200, 316, and 153 mg. respectively, so that the œdema was not apparently proportional to the amount of cholesterol present in the blood. This is not in agreement with the results of Maxwell,[3] who found that in acute nephritis with œdema the cholesterol content is raised proportionately to the œdema. The possibility of a complication such as anæmia being responsible for the normal cholesterol content in those cases showing considerable œdema has been considered, but in none was any complication found, and the degree of anæmia present was slight. The five non-œdematous cases gave readings of over 200 mg., the maximum being 333 mg. and, as in the majority of cases in the group, a fall in cholesterol occurred with recovery.

TABLE II. (GROUP 1).—ACUTE NEPHRITIS.

Case.	Sex and age.	B.p. mm. Hg.	Œdema.	Blood-urea N.*	Plasma cholesterol*		Urine on admission.			Albumin. Urine on dismissal.
					I.R.	F.R.	Alb.	Blood.	Casts	
1	M 11	160/100	Cons.	18·1	177	133	+++	tr.	+	Abs.
2	M 25	210/140	Face†	18·0	259	155	++	0	+	"
3	F 24	126/90	Face	15·6	250	155	+++	0	+	"
4	F 48	168/96	Slight	18·3	189	154	+++	0	+	"
5	M 28	142 88	Slight	10·0	131	114	+++	0	0	"
6	F 50	160/120	Slight	17·0	245	220	+++	++	+	tr.
7	M 38	180/100	Cons.	18·5	200	220	+++	++	++	"
8	F 30	180/100	Slight	18·0	200	225	+++	tr.	+	Abs.
9	M 17	110/70	Abs.	29·7	212	138	+++	+++	+	"
10	M 27	150/118	Face	11·0	133	—	+++	tr.	+	"
11	F 16	142/80	Abs.	10·2	228	202	+++	+++	++	tr.
12	M 13	102/70	Abs.	14·0	266	208	+++	+++	++	tr.
13	M 24	170/110	Face	17·7	174	166	+++	+	+	Abs.
14	F 13	172/112	Face	39·0	212	196	++	0	+	"
15	M 18	168/72	Face	30·2	274	140	+++	+	+	"
16	F 8	—	Cons.	25·4	316	274	+++	+++	+	"
17	M 23	117/82	Face	19·6	232	181	++	0	++	tr.
18	F 21	102/72	Abs.	29·7	202	138	+++	+++	0	"
19	M 12	130/100	Face	13·0	363	253	+++	0	0	"
20	F .5	160/100	Cons.	30·0	153	143	+++	+	0	Abs.
21	F 12	160/110	Face	52·8	143	240	+++	+++	++	"
22	F 28	120/88	Abs.	20·5	333	244	+++	0	++	tr.

* mg. per 100 c.mm. B.p. = Blood pressure. Alb. = Albumin. I.R. = Initial reading. F.R. = Final reading. Cons. = Considerable; † Face = Puffiness of face, no œdema elsewhere. Abs. = absent; tr. = trace.

Comments.—CASE 6. Albuminuria disappeared five months later. 11. No albuminuria a year later. 13. Convulsions on admission. 15. Convulsions on admission. 16. Convulsions on admission. Slight albuminuria reappeared four months later. 19 and 20. Convulsions on admission. 21. Semi-comatose on admission.

In nine cases the cholesterol content of the plasma at the time of dismissal from hospital was over 200 mg. Of these nine cases, Nos. 7, 8, and 21 have already been mentioned. The remaining six, Nos. 6, 11, 12, 16, 19, and 22, all made a very slow recovery and, with the exception of Case 16, were eventually dismissed with slight albuminuria. Three cases, Nos. 6, 11, and 22, became albumin-free within a year of dismissal, while in Case 22 the cholesterol fell in a period of five months from 244 mg. to 154 mg. In Case 19 albuminuria was still present one month after leaving hospital, but the cholesterol content showed a decrease of 19 mg., the value now being 224 mg. On the other hand, the only case of the six who had no albuminuria on dismissal, Case 16, was found four months later to have a faint trace of albumin in the urine and casts in the deposit. From these six cases, therefore, it would seem that a slowly falling cholesterol content is associated with slow resolution, if not indeed with a chronic lesion.

Six cases of the group had pronounced nervous disturbance. Five of them had convulsions, and their initial readings ranged from 153 to 363 mg., giving an average value of 255 mg. There was no nitrogen retention in these cases, so that they are not comparable to the sixth case, No. 21, or to the uræmic cases of the chronic interstitial group. Although the average of 255 mg. is above normal, the range of values in the five cases is wide, and suggests that there is no direct relationship between the onset of convulsions and the cholesterol content. On the other hand, the only case, No. 21, having nitrogen retention gave a normal value of 143 mg. This is in accord with the normal or low values found in uræmic cases of the interstitial group, which will be discussed later.

It was hoped that by periodic examinations of the acute cases at regular intervals after dismissal from hospital a better idea of the prognostic value, if any, of the cholesterol estimations might be obtained, but unfortunately this has not been found practicable except in a few cases.

GROUP 2.

Chronic Interstitial Nephritis.

Estimations were made in 11 cases of this type, which was characterised by vascular changes, raised blood pressure, and nitrogen retention in the blood. Most of the cases showed also albuminuric retinitis. Five of the patients had uræmia. The maximum, minimum, and mean readings were 266, 141, and 182 mg. respectively. Four cases gave values of over 200 mg., and of these, three, Nos. 26, 30, and 32, had pronounced vascular changes, while the fourth, No. 25, had generalised anasarca and was in extremis on admission (Table III.). Of the cases with slight arterial degeneration, the maximum, minimum, and mean readings were 194, 141, and 170 mg.; that is to say, the values were within the normal range.

Five of the patients died, and subsequent readings are available in only six cases of this group. The average cholesterol content in the five fatal cases was 195 mg. Where a second estimation was made the reading, with three exceptions, showed little change from the initial value, but in no instance did a decrease in cholesterol accompany clinical improvement. Cases 28 and 33, who were uræmic on admission and had cholesterol values of 145 and 182 mg. respectively, showed a gradual rise in the cholesterol content during convalescence. On examination one year later, Case 28 was found to have only a slight albuminuria. Case 33, two months after dismissal, appeared well, though still excreting considerable amounts of albumin; her subsequent history is not known. In these two cases the rise in cholesterol should probably be interpreted as a return to the normal from the low reading which had been found during the period of uræmia. Regarded in this way, the results agree with those in the other uræmic cases of the group, and also with the observation of Maxwell,[3] Henes,[5] and others, who reported low values in uræmia.

It is of interest at this point to recall the fact that in Group 1—acute cases—the only patient showing nitrogen retention gave a low initial reading, which gradually rose during convalescence. On the other hand, the remaining cases of Group 1 which showed marked nervous symptoms but had no nitrogen retention did not have consistently low values. It seems therefore that, where uræmic manifestations are associated with nitrogen retention in the blood such as occurs in chronic nephritis (especially of the interstitial type) and occasionally in acute nephritis, low or normal cholesterol values are the rule. The rise occurring during convalescence (two cases) is interesting in the light of Henes'[5] work on chronic nephritis. He found that cases which were progressing favourably showed a hypercholesterinæmia, and suggested that cholesterol was analogous to an antitoxin. Case 23 is worthy of note. The patient had been treated eight months previously for chronic interstitial nephritis, and the cholesterol content, estimated on two occasions, was then 194 and 192 mg. On readmission, the patient was comatose and the cholesterol was found to be 173 mg. Death occurred within 24 hours and post-mortem examination confirmed the diagnosis. The course of events in this case and also in Case 63 of Group 5, the mixed type of nephritis, shows that the onset of uræmia in chronic nephritis is attended by a fall in the cholesterol content of the plasma. This is in agreement with the results of other workers.[3] [5]

TABLE III. (GROUP 2).—CHRONIC INTERSTITIAL NEPHRITIS.

Case	Sex and age	B.p. mm. Hg.	Œdema	Blood-urea nitrogen*	Plasma cholesterol*		Urine.		
					I.R.	F.R.	Alb.	Blood	Casts.
23	F 19	120/90	Abs.	52·0	194	192	+ + +	tr.	+
R.-a		135/75	,,	78·0	173		+ + +	+	Abs.
24	M 57	182/124	Slight.	50·0	166		+ + +	Abs.	+
25	M 26	234/135	Cons.	66·6	245		+ + +	tr.	+
26	M 44	230/180	Abs.	70·4	250		+ + +	Abs.	+
27	F 25	164/105	,,	125·0	141	140	+ + +	tr.	+
28	F 65	100/66	,,	76·6	145, 154, 196		+ +	+	+
29	M 62	170/100	,,	81·0	170	172	+ + +	+	Abs.
30	F 53	194/100	,,	60·0	266		+ + +	Abs.	+
31	M 35	152/105	Very slight.	46·0	187		+ + +	+ +	+
32	F 46	180/120	Slight.	69·6	266	270	+ + +	Abs.	+
33	F 67	166/120	Cons.	80·0	182, 234, 210		+ + +	+	+ +

* mg. per 100 c.cm. I.R. = Initial reading. F.R. = Final reading.

Comments.—CASE 23 on re-admission (R.-a.): uræmic coma, death. 24. Uræmia arterio-sclerosis, death. 25. Uræmia death. 26. Arterio-sclerosis, asthma, death. 27. Progressive anæmia, death. 28. Uræmia. 29, 30, 32. Arterio-sclerosis. 33. Uræmia, asthma.

GROUP 3.

Arterio-sclerotic Cases.

It is convenient at this point to consider a group of cases in whom arterio-sclerosis was the predominant clinical feature. Nine of these had evidence of renal disease. The difficulty of differentiation between arterio-sclerotic cases with renal involvement and chronic nephritis with secondary vascular changes is generally acknowledged. Evans[6] states that there is no accepted clinical distinction between the two, and that a "pathogenic factor simultaneously causes both renal and vascular lesions; a varying incidence on renal or vascular tissue accounts for the unequal change in these tissues in different cases."

For the purposes of this investigation, distinction was made on two points: (1) the very marked cardiovascular signs and symptoms found in arterio-sclerosis; and (2) the absence of nitrogen retention in the blood, with a good response to the urea-concentration test. In general, also, the arterio-sclerotic patient was stout and florid, whereas the chronic nephritic tended rather to be pale and thin.

The maximum, minimum, and mean readings for the whole group were 314, 166, and 245 mg. respectively, while for those having nephritis the figures ranged from 314 to 182, giving an average of 256 mg. Three cases had readings of under 200 mg.; one of these had nephritis, while of the other two one had asthma and the other had hæmoptysis, for which he was sent to hospital as an urgent case. It will be seen, therefore, that the figures for the group are considerably higher than those for the previous group of interstitial nephritis cases.

TABLE IV. (GROUP 3).—ARTERIO-SCLEROTIC CASES.

Case	Sex and age.	B.p. mm. Hg.	Œdema	Blood-urea nitrogen*	Plasma cholesterol*	Urine.		
						Alb.	Blood	Casts
34	M 54	250/140	Abs.	28	250	+++	0	0
35	F 52	220/156	"	14	253	+++	0	+
36	M 50	250/155	"	22·4	260	++	0	—
37	M 62	196/78	"	11·5	241	++	0	+
38	M 65	200/120	"	21·5	283	++	0	+
39	M 61	164/120	"	—	166	tr.	0	0
40	M 46	220/140	"	66	244	+++	0	+
41	M 57	210/140	"	18	307	+++	0	++
42	M 53	188/110	"	64	245	+++	0	+
43	M 59	180/112	Slight.	15·2	314	++	+	+
44	M 54	190/100	Abs.	18·6	182	+++	0	+
45	M 64	196/115	"	18·5	190	0	0	0
46	M 64	148/90	"	22·9	260	0	0	0

* mg. per 100 c.cm.

Comments.—CASES 34, 35, 36, 37. Nephritis. 38. Nephritis, myocarditis. 39. Asthma. 40. Myocarditis. 41. Nephritis; myocarditis. 42. Nephritis. 43. Nephritis; myocarditis. 44. Nephritis. 45. Hæmoptysis. 46. Valvular disease of heart.

Two cases of the group, Nos. 40 and 42 (Table IV.), were exceptional in that they showed nitrogen retention. They are included in this group rather than in Group 2 because the clinical picture was that of advanced arterio-sclerosis. Case 40 gave a good response to the urea-concentration test, but was extremely ill and died four days after admission. The cholesterol content was 244 mg. Case 42 had had a mild nephritis eight years before. At that time albuminuria was moderate, there were no casts in the urine and the blood pressure was not raised. On readmission the patient was dyspnœic and had some œdema which was most probably of cardiac origin, being slight and confined to the lower extremities. The cholesterol content was 245 mg. It is probable that in this case there was a recrudescence of the original kidney affection at the time of readmission to hospital, but that in the interval since the first attack the "pathogenic factor," whatever its nature, had affected the vascular tissues more severely than the renal, thus producing a clinical picture of arterio-sclerosis rather than of chronic nephritis.

From consideration of this group, therefore, it is apparent that the presence of arterio-sclerosis is usually associated with a hypercholesterinæmia, particularly if a renal lesion is also present. In cases showing no albuminuria, the cholesterol content seems to vary, but the number of cases of this type investigated is much too small to allow of any deductions.

Difference of opinion exists regarding the association of hypercholesterinæmia and arterio-sclerosis, but the great majority of workers have found that arterio-sclerosis is accompanied by a high cholesterol content. Much experimental and other work has been done in an attempt to determine the nature of this relationship, and also the relationship of hypercholesterinæmia and hypertension. Experiments on rabbits by feeding with cholesterol have been made by various workers[7, 8] and seemed to prove that arterio-sclerosis was the result of hypercholesterinæmia. These results, however, were not confirmed in carnivorous animals. Dewey[9] found that feeding with cholesterol produced not only arterio-sclerosis but definite lesions in the tubules of the kidney. Newburgh,[10] in 1923, found that, by feeding rabbits with a diet rich in protein but with a low cholesterol content, lesions resembling human arterio-sclerosis could be produced. Later, in 1926,[11] he confirmed this, but found also that where arterio-sclerosis was present a hypercholesterinæmia also developed. This elevation of blood cholesterol Newburgh believed to be due to a metabolic disturbance, directly referable to the excess of protein in the diet and not to its cholesterol content. Other workers—Nuzum, Seigal, Garland, and Osborne[12]—produced hypertension and arterio-sclerosis by a high protein feeding and found that these phenomena were most pronounced when the acid-base balance resulting from prolonged feeding with protein was most disturbed.

Recent work by Moscowitz[13] on experimental arterio-sclerosis is of interest. He found that the arterial lesions produced by cholesterol feeding were not permanent; moreover, in investigations in the human subject, he failed to find a constant hypercholesterinæmia in arterio-sclerosis unless a complication was present. He concludes, therefore, that cholesterol plays only a part in the production of experimental arterio-sclerosis, and that the mechanical factor of pressure is important. Waldorp[14] also, from his own work and from a study of the results of various other workers, concludes that hypercholesterinæmia in itself is not sufficient to cause hypertension and arterio-sclerosis, but that in its presence the hypertensive action of certain substances in the blood, such as adrenalin, is increased.

It is therefore evident that the problem is complex and that much work is still necessary.

GROUP 4.

Parenchymatous Nephritis.

Estimations were made in 13 cases of this type, which was characterised by (1) the presence of albuminuria, hæmaturia, and œdema, and (2) the absence of cardiovascular changes and nitrogen retention. In most cases, also, anæmia was a marked feature.

The maximum, minimum, and mean values for the group were 408, 166, and 259 mg. respectively—i.e., there is a definite hypercholesterinæmia in these cases.

A second point of considerable importance is the general tendency to a rise in the cholesterol content during convalescence. This is shown by the following results, which were obtained in nine cases in which of the chest confirmed the clinical finding of an enlarged heart, but no physical signs attributable to an adherent pericardium could be discovered. The pleura showed no abnormality. Microscopical sections of the deposit removed from the surface of the spleen show hyaline fibrous tissue on the free peritoneal surface of the deposit and for the greater part of its thickness. Near the splenic surface the type of fibrous tissue changes and there are signs of considerable activity. Fibroblasts are seen in active mitosis, histiocytes and plasma cells are plentiful, and here and there are deposits of lymphocytes. A few capillaries can be seen in process of formation (Fig. 3).

DISCUSSION.

There is no evidence to suggest that local disease of the parenchyma of the spleen was present in this case and the appearances of the deposit suggest that it belongs among those cases which are rather vaguely grouped together under the name of multiple serositis. Pick,[1] who was one of the first to give his attention to the disease, held the view that in his cases the chronic changes in the peritoneum were entirely secondary, attributing their presence to the influence of ascites, which in its turn was due to circulatory disturbance and tissue hyperplasia in the liver. Harris,[2] however, writing in 1895, speaks of ascites "due to chronic peritonitis which may occur so early as to be probably independent of venous stasis," and Kelly,[3] a little later, advances a theory that elimination of toxins of rheumatic and tuberculous origin from the abdomen may take place by way of the diaphragm which itself undergoes pathological alterations on one or other side during the process. Other cases seem to be certainly primary in the pericardium and several have been recorded which started with a definite known pericarditis.

Hale-White[4] distinguishes a partial and a general perihepatitis and perisplenitis. He quotes nine cases of partial perisplenitis of non-specific origin and a large proportion of these had heart disease sufficient to cause back pressure.

The case here recorded corresponds to Hale-White's "partial" type in that the deposit was patchy and could not be peeled off the spleen. The changes were certainly not due to back pressure as there were no signs of cardiac failure. The history of a definite rheumatic infection some seventeen years previously supplies a possible cause for the condition, and it may be that a similar change is present in the pericardium accounting for the symptomless enlargement of the heart.

In Kelly's words "the striking clinical feature of the disease is ascites." Pain is seldom mentioned, and I have not been able to trace any previously recorded case in which deformity of the stomach was shown to be present.

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[1] Pick, F.: Zeit. f. Klin. Med., 1896, xxix., 385.
[2] Harris T.: Med. Chron. 1895, Vol. 2.
[3] Kelly, A. O. J.: Amer. Jour. Med. Sci., 1903, cxxv., 116.
[4] Hale-White, W.: Trans. Clin. Soc., London, 1888, xxi., 221.

CLINICAL AND LABORATORY NOTES

PELVIC ABSCESS CAUSED BY BACTERIUM TYPHOSUM.

BY F. T. RANSON, M.B. BELF.,

AND

W. K. DUNSCOMBE, M.D. DURH., M.R.C.S., D.T.M. & H. ENG.,

DIRECTOR OF THE PATHOLOGICAL LABORATORY, SHANGHAI MUNICIPAL COUNCIL.

INFECTIONS of the pelvic area by *Bacterium typhosum* do not appear to be at all common; hence the following account may be of interest.

The patient, Miss A., was admitted to hospital on Nov. 14th, 1929, with a fever, clinically a typical typhoid, which ran a severe but normal course, the temperature becoming normal on Dec. 10th. Two days later there was a slight elevation of temperature which at first was thought to be due to a dietary indiscretion the previous day, but subsequently it kept rising steadily each day and no cause could be found for its recurrence.

On Dec. 21st a white cell count gave the following results: white cells 12,000, polymorphs 70 per cent., and lymphocytes 27 per cent. After prolonged examination a tender lump was discovered in the left side of the pelvis; the lump was about the size of an orange and slowly got larger.

On the 31st a white cell count gave: white cells 15,000 polymorphs 78 per cent., and lymphocytes 20 per cent. The abdomen was opened the same day (by F. T. R.) through a left paramedian incision, and a mass was seen behind the left broad ligament. Accordingly, the peritoneum was closed and stripped back in order to expose the mass extraperitoneally. On opening the swelling a little thin pus and some glairy fluid was extruded, and some loculi were broken down with the finger, but as the patient's condition was critical, a drainage-tube was inserted and the operation completed rapidly.

She made a steady recovery, there was very little drainage, and the temperature and leucocytosis gradually disappeared, a white cell count on Jan. 10th giving: white cells 11,600, polymorphs 71 per cent., and lymphocytes 24 per cent. She was discharged from hospital on Feb. 1st, 1930. Subsequent examination showed that the lump was still there, so the patient was examined at intervals for the next seven months, since it had been decided to wait some time before attempting to remove the tumour. During this period she was in excellent health except for occasional attacks of pain in the lower abdomen.

On Oct. 16th the abdomen was opened again and the tumour was seen to be much bigger than at the previous operation. The uterus was pushed forward under the symphysis, and the Fallopian tubes were lightly adherent to the front of the swelling. There were dense adhesions between the left side of the tumour and the sigmoid colon, and the peritoneum over the tumour was thickened and adherent. It was decided that enucleation was impossible. A needle was inserted into the swelling and thick greenish pus found—a rather unsuspected event. The abscess, therefore, was opened and drained of a large quantity of pus. The tube was removed on the fifth day, as by this time drainage had almost ceased and the patient made a rapid recovery.

The pus which was removed at the second operation was sent to the Municipal Laboratory. It was thick, almost viscid, and tinged with blood. A considerable number of pus cells was present in stained films, but no organisms were seen. Cultures were *inoculated into* veal broth and on to trypsin-agar plates. An actively motile Gram-negative bacillus was found, which on inoculation into the usual sugar media gave the biochemical reactions of *B. typhosum*. Agglutination was positive to a titre of 1/25000.

The results of the Widal tests are as follows:—

Nov. 15th, 1929.	Nov. 21st, 1929.	Oct. 27th, 1930.
T, 200.	T, 240	T, 650.
A, negative.	A, negative.	A
B, greater than 50.	B, 200	B } negative.
C, negative.	C, negative.	C

A sterile catheter specimen of urine was sent at the same time, but no *B. typhosum* was isolated.

The question arises as to what was the origin of this abscess? There are two possibilities: (1) infection of the pelvic lymphatic tissues; (2) infection of a previously existing retroperitoneal cyst. It is very difficult to decide between them. Also the patient was not radiographed, so the possibility of a bony origin is not absolutely excluded; but clinically, there was nothing to suggest that this might be the cause.

We are indebted to Dr. J. H. Jordan, Commissioner of Public Health, Shanghai Municipal Council, for permission to publish this.

LATERAL TRACHEAL DISPLACEMENT.

THE LARYNGOLOGICAL APPEARANCE AND ITS SIGNIFICANCE.

By J. E. G. McGibbon, M.B. Lond., D.L.O.,

AURIST AND LARYNGOLOGIST, LIVERPOOL EYE AND EAR INFIRMARY; VISITING LARYNGOLOGIST, FAZAKERLEY SANATORIUM.

The laryngoscopic appearance described below is caused by lateral displacement of the trachea. Although it will be familiar to all laryngologists, its significance as a possible indication of grave intrathoracic disease does not appear to be defined.

Normally the imaginary chords joining the arcs of the tracheal rings, visible in a laryngeal mirror through the glottis, are at right angles to the glottic axis (Fig. 1). When the trachea is displaced laterally the mirror-view of the direction of the tracheal rings is altered, and the chords then make angles greater or less than 90° with the glottic axis (Fig. 2).

Excluding obvious tumours in the lower cervical region, scoliosis and gross deformities of the chest, lateral tracheal displacement may be caused by fibrosis or atelectasis of the lung, pleural effusion, and mediastinal neoplasm. The fibrosis associated with pulmonary tuberculosis is probably the most common cause of such displacements of the trachea. I have observed it frequently during routine examination of a large number of sanatorium inmates.

FIG. 1.

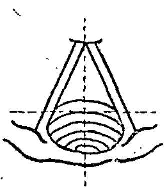
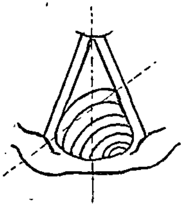


FIG. 2.

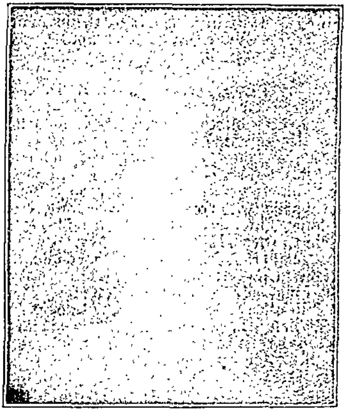


Patients suffering from chronic pulmonary tuberculosis not infrequently seek early advice from a laryngologist. They complain of vague discomfort, irritation in the throat, voice fatigue, or recurrent attacks of loss of voice. Indirect laryngoscopy in such cases may fail to reveal any manifest abnormality in the larynx; or possibly atony of the tensors, adductor weakness, or pinkness of the cords may be present. Absence of objective signs or the presence of such insignificant lesions is disarming. The symptoms may be attributed to functional nervous disorders, bad voice-production, or simple chronic laryngitis. A thorough clinical examination of the patient is not undertaken, or postponed until more serious symptoms develop. The presence of lateral tracheal displacement associated with such indefinite symptoms or signs should arouse suspicion of intrathoracic disease, and calls for an investigation of the thoracic contents.

The following brief notes of three cases illustrate the importance of noting this sign:—

Case 1.—A domestic employed by a medical man was brought for examination complaining of severe paroxysms of coughing. These occurred chiefly in the mornings. There was no expectoration, and the patient's general condition appeared good. Clinical investigation of her chest had been negative. Examination of her upper respiratory tract revealed nothing abnormal except lateral tracheal displacement. An X ray of the chest was suggested, and the radiologist reported X ray evidence of pulmonary tuberculosis. The patient's employer was still unconvinced, owing to the lack of clinical signs. On inquiry a few months later, however, it was found that the patient's sputum had become positive, and that she was under the care of the local tuberculosis authority.

FIG. 3.

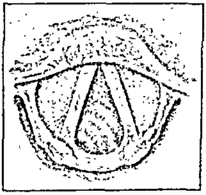


Case 2.—A man, aged 36, complained of an unpleasant taste in his mouth and throat in the mornings. Examination showed slight atrophic rhinitis and laryngitis sicca, with lateral displacement of the trachea. X ray examination revealed healed pulmonary tuberculosis of his right lung.

Case 3.—A woman, aged 54, complained of discomfort in her throat of four years' duration. Examination showed nothing abnormal in her pharynx or larynx; there was lateral displacement of the trachea. X ray showed a light degree of scoliosis.

Fig. 3 shows the X ray appearances of a male patient, aged 44, suffering from chronic bilateral pulmonary tuberculosis, with retraction of the right upper lobe and displacement of the trachea and mediastinal contents to the right side. Fig. 4 shows the laryngoscopic appearance in the same patient.

FIG 4.



I am indebted to Dr. J. H. Mather for the radiological reports in the three cases quoted; to Dr. A. E. Connolly for the radiogram; and to Dr. Claude Rundle, medical superintendent of Fazakerley Sanatorium, for permission to publish it.

of the chest confirmed the clinical finding of an enlarged heart, but no physical signs attributable to an adherent pericardium could be discovered. The pleura showed no abnormality. Microscopical sections of the deposit removed from the surface of the spleen show hyaline fibrous tissue on the free peritoneal surface of the deposit and for the greater part of its thickness. Near the splenic surface the type of fibrous tissue changes and there are signs of considerable activity. Fibroblasts are seen in active mitosis, histiocytes and plasma cells are plentiful, and here and there are deposits of lymphocytes. A few capillaries can be seen in process of formation (Fig. 3).

DISCUSSION.

There is no evidence to suggest that local disease of the parenchyma of the spleen was present in this case and the appearances of the deposit suggest that it belongs among those cases which are rather vaguely grouped together under the name of multiple serositis. Pick,[1] who was one of the first to give his attention to the disease, held the view that in his cases the chronic changes in the peritoneum were entirely secondary, attributing their presence to the influence of ascites, which in its turn was due to circulatory disturbance and tissue hyperplasia in the liver. Harris,[2] however, writing in 1895, speaks of ascites "due to chronic peritonitis which may occur so early as to be probably independent of venous stasis," and Kelly,[3] a little later, advances a theory that elimination of toxins of rheumatic and tuberculous origin from the abdomen may take place by way of the diaphragm which itself undergoes pathological alterations on one or other side during the process. Other cases seem to be certainly primary in the pericardium and several have been recorded which started with a definite known pericarditis.

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The case here recorded corresponds to Hale-White's "partial" type in that the deposit was patchy and could not be peeled off the spleen. The changes were certainly not due to back pressure as there were no signs of cardiac failure. The history of a definite rheumatic infection some seventeen years previously supplies a possible cause for the condition, and it may be that a similar change is present in the pericardium accounting for the symptomless enlargement of the heart.

In Kelly's words "the striking clinical feature of the disease is ascites." Pain is seldom mentioned, and I have not been able to trace any previously recorded case in which deformity of the stomach was shown to be present.

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CLINICAL AND

were through their

PELVIC A iscovery of diphtheria antitoxin, sera been prepared for the treatment and control of scarlet fever, pneumonia, dysentery, and other infections, which were now being more widely used in medical practice. Closely allied was the group of diagnostic agents, such as the Schick test toxin and old tuberculin, and probably others would be added. There were also substances for the active immunisation of man, such as the mixture called diphtheria prophylactic. In the short history of the use of diphtheria prophylactic a number of misfortunes had occurred. Some were due to errors in manufacture, some to mishandling of the product after it was made. The speaker believed that in England, thanks to the cordial coöperation of manufacturers and by the operation of the Therapeutic Substances Act, the possibility of accidents in regard to diphtheria prophylactic had now been reduced to vanishing point.

In experimental physiology and pharmacology a whole chapter of exact information had been added concerning the extract of the posterior lobe of the pituitary gland, so that physicians could now use it in a precise and safe way which had not previously been possible. The characteristics of many of the substances which came under the Act were that they were markedly and sharply specific; that many were dangerous if improperly prepared, or inaccurately standardised, dispensed, or administered; and that they must be given in precise and easily adjusted dosages. A typical example of such a drug was insulin.

Without some agreed system of measurement there was no means of comparing the studies of these substances in laboratories, let alone in different countries. The speaker described briefly the preparation of biological standards. It was found that definite fixed quantities of the substance produced definite effects. Having arrived at a standard,

from other

home products had to be dealt with, the matter would be simplified, but an embargo could not be placed upon the use in Britain of substances made in other countries, provided the requirements were complied with. No licence was issued in this country to foreign manufacturers, but only to the importers resident here. During the past year the licences of several importers had been cancelled owing to failure to satisfy the regulations.

Another activity of the licensing authority was that of control. His own view was that if the physical requirements of the laboratory and selection of the staff were satisfactory, troubles of control were greatly reduced. Not every sample of the substances could be examined, but the regional medical officers were asked to make a collection of a particular article, samples of which were bought in different towns and examined from every point of view. Last year 555 such collected specimens were examined. Fourteen of the samples of diphtheria antitoxin were found to be below strength, and they came from foreign licensees. The licences in question were withdrawn. Vaccine lymph needed careful control. It must be free from gas-producing anaerobes and from hæmolytic streptococci, and must contain no more than a certain number of living micro-organisms per c.cm. It must also pass the test for potency. Seven samples of lymph failed, on some count, to reach the required standard, and appropriate action was taken in each case by the licensing authority. Two defective samples of pituitary extract were found, but as a satisfactory explanation was given, no licences were withdrawn on this account.

Sterilised surgical ligatures were included in the provisions of the Act, for there was no other way of exercising control. Last year 138 varieties of catgut were examined, and 42 (over 30 per cent.) were found to be contaminated. There were nine applications for making the material, but only six were granted. Five of seven applications for import licences were granted.

DISCUSSION.

Dr. R. A. O'BRIEN said that the government staff deputed to carry out the provisions of the Act had helped in every way. It had been shown that there was grave need of control in these matters. Serious irregularities had been found in connexion with some of the substances. Alleged tuberculin was issued which had no tuberculin in it; also diphtheria antitoxin with less than half the units stated on the label, Schick toxin of only half the required strength. Broadly, one must aim at getting biological materials to within 20 per cent. of value; he had seen it done to within 2 per cent. The testing of some of the substances, such as the Schick toxin, was laborious and complicated. It was hoped to make a Schick toxin which would stand room temperature for several days.

Dr. E. W. GOODALL spoke of the value which the Act of 1925 was to the general public, and said he wondered such a law was not brought in many years ago, though THE LANCET Commission inquired into the subject before the Act was passed, that body having included some of the best bacteriologists in this country. That Commission certainly found serious discrepancies.

Dr. J. D. ROLLESTON expressed his gratitude for the paper, the second on a somewhat similar subject he had heard this week, the other by Dr. H. H. Dale at the meeting of the Research Defence Society.

Dr. ALEXANDER JOE said the Act was the result of intensive medical research. Much more work was needed; for instance with regard to antimeningococcal and scarlet fever antiserum.

Dr. HARTLEY, in reply, said inspectors had insisted that those who imported and distributed vaccine lymph should instal cold-storage facilities, and complaints were not so frequent nowadays as formerly.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.

THE annual meeting of this society took place on June 18th, the chair being taken by the President, Dr. G. CARMICHAEL LOW. Before the scientific business was commenced, the President presented to Dr. N. Hamilton Fairley the Chalmers Medal for his work in the domain of tropical medicine.

Dr. ERNEST MUIR read a paper on the

Treatment of Leprosy.

Leprosy, he said, had for ages been regarded as an incurable and hopeless disease, and "once a leper always a leper" had been an accepted axiom. Though Hansen's bacillus was the cause of the disease, it could not be found in many of the patients in the leper asylums of the East, for in them the bacillus had died out, leaving only scars and deformities. Generally leprosy was not in itself fatal, the death of the victims being due to the complications begotten of neglect and exposure; in those surviving long enough the tendency of the disease, qua infection, was to die out. Hence the physician's obvious duty was to study the conditions favouring the automatic eradication of the infection and to supplement them. Treatment in the early stage of leprosy was comparatively simple if the general condition of the patient was susceptible of improvement. Leprosy appeared to be confined entirely to members of the human race, and even man in a healthy state was highly resistant to the disease; hence the importance of the vigour of the general state. When the disease did develop it was because in that person it had found a soil with the requisite lack of resistance. Of those in India who showed slight clinical signs only a small proportion developed sufficient lesions to constitute a disease, yet in them a temporary indisposition would lead to an exacerbation. An idea was prevalent that only some form of injection treatment was of value, but in Calcutta the health factor was constantly being stressed. He had recently been much impressed with the value of the erythrocyte sedimentation test as an index of the resistance of the patient; it was an even more certain test in leprosy than in tuberculosis. All the patients in the Calcutta establishment were regulated by this test. Briefly, it meant that the slower the sedimentation of the red blood-cells, the greater was the resistance of the patient to leprosy; whatever accelerated sedimentation could be regarded as a factor favouring in that patient the spread of the disease. The fact of a patient suffering from leprosy did not mean of necessity that his resistance was low when seen, as he might have had malaria or other disease when the leprosy started, but that since his general health had improved there had not been time for the leprosy to disappear. If the resistance was low, special anti-leprotic treatment should be delayed until there had been brought about some definite improvement in the general resistance.

In the treatment of leprosy the oils of the hydnocarpus or chaulmoogra group and their preparations had been used for centuries, and the modern use of them was by injection into the tissues. Temporarily the resistance was lowered after the injection—i.e., it caused a negative phase. Weekly injections, with careful observation, said Dr. Muir, gave best results; intradermal was better than intramuscular injection, advantage being taken of the anæsthesia and deep analgesia incident to the disease. Ten to twenty square inches of selected skin was thus infiltrated at a time, and his custom was to use a needle whose guard was placed 2–3 mm. from the point, which ensured against too deep a penetration; but it must be deep enough. It had been shown that the drug was taken up by the local cells, and remained in them for several months. Hydnocarpus oil itself was not suitable, because of its viscosity; it tended to push the tissues aside instead of finding its way into the intercellular spaces. The esters, the aqueous solution of the sodium salts, and various mixtures and synthetic preparations, were more useful. Suitably prepared ethyl esters remained in the cells for months. It was important that the esters should have a mild irritative power, and a moderate degree of pain exerted a desirable psychological effect on the native patient. In patients with only a few patches, and in whom a good resistance could be maintained, progressive improvement resulted from infiltration once a fortnight or even monthly.

The lepra reaction sometimes occurred in patients who had passed beyond the first stage of the disease; apparently it was a hypersensitised or allergic state; previously noticeable leprous lesions swelled up and became inflamed, and new lesions appeared. In nerve leprosy it often caused intense pain in the nerves. Sometimes this reaction was brought about by pressing the treatment of leprosy too hard; it might disappear in a few weeks, or might last months, even years, depending on the condition of the resistance. This phenomenon should always be guarded against; when it occurred, the patient must be kept at rest and given light nourishing food. For raising the resistance, the intravenous injection every second day of 0·02 g. of potassium antimony tartrate was valuable, as were large doses of calcium and alkalis given orally. The pain in the nerve cases was greatly relieved by using adrenalin intramuscularly, or ephedrine orally or by infiltration. It was necessary to proceed slowly, keeping watch on the general health.

The mental attitude of the patient Dr. Muir regarded as a very important factor in successful treatment; without the patient's utmost effort and coöperation it would be impossible to maintain the general health at the requisite level. The chief cause of relapsed cases was the discharge of patients from institutions as "arrested" (a term preferred to "cured") without sufficiently careful tests having been carried out. If experts found positive bacteriological evidence at any time within two years, treatment must continue. Any raised or erythematous appearance of the skin caused by leprosy must be considered an active sign of disease. Potassium iodide was a useful auxiliary in clearing up the last remnants of the disease.

The findings of the Bangkok Conference as to prophylaxis had been adopted by the Health Committee of the League of Nations, and at the Manila Conference the 22 experts from all over the world arrived at agreement on every point. These represented large strides forward. It had been decided to run an international journal of leprosy.

DISCUSSION.

Sir Leonard Rogers paid a tribute to the work of Dr. Muir, especially his insistence on the factor of the general health in cure. During ten years Dr. Muir had trained a thousand medical men to treat leprosy, and they were now dealing continually with many thousands of cases in early stages of the disease. Isolation had been practised only in regard to advanced cases which had already infected others when they were taken in hand. The great advancement was the recent establishment of skin clinics, which Dr. Wade had actively promoted, for here were seen cases of leprosy in the most hopeful stage, when probably no infection had been communicated to others.

Dr. R. G. Cochrane contented that leprosy was only just pathogenic to man—i.e., only when his condition was below what it should be. In the native it was important to cause as little pain in the treatment as possible, otherwise he would not continue.

Dr. A. B. Welsh spoke of leprosy work at an island near Port of Spain, where 154 patients could be returned to their homes, as they were mostly "burnt-out" cases. The chief depressing complication was ankylostomiasis. People were now presenting themselves earlier for treatment than formerly.

Colonel N. N. King spoke of the importance of the observation that the lobe of the ear was a seat of predilection for the commencement of leprosy; he also referred to the use of such simple measures as vapour baths, to increase the blood-supply to the lesions.

Dr. Louise Pearse (U.S.A.) said the work on trypanosomiasis confirmed the importance of a high state of general resistance, as also did work on experimental syphilis. If syphilis and vaccinia were both inoculated into an animal, the lesions of each were much more severe than if one disease alone were communicated.

REVIEWS AND NOTICES OF BOOKS

Cancer.

International Contributions to the Study of Cancer in Honour of James Ewing. Edited by F. E. Adair. London: J. B. Lippincott Company. 1931. Pp. 484. £2 5*s*.

It was a happy idea of our American colleagues to invite leading authorities on the various aspects of the problem of malignancy, both in America and in Europe, to contribute to a special volume in honour of Prof. James Ewing. The book is lavishly illustrated and contains over 50 contributions which have been divided into four parts: Cancer in its General Relations, Cancer Research, Regional Cancer, and Radium and Roentgen Ray Therapy. The first contribution, by Sir Lenthal Cheatle, is entitled Natural Law in Pathological Growth. This is followed by a paper on the Present Status of the Cancer Problem by Prof. C. C. Little, President of the American Society for the Control of Cancer. The next two papers by Dr. William Mayo and by Dr. W. Cramer have the same title Susceptibility to Cancer, and both deal with the existence of a constitutional factor in the incidence of cancer. The argument developed is reinforced by the next contribution on Heredity and Cancer from the pen of Prof. Deelman of Groningen. On the basis of a series of carefully collected cases of cancer, the family histories of which were known, he is able to show that there is a definite hereditary factor affecting the incidence of cancer. The existence of such a factor as susceptibility is further emphasised by Miss Maud Slye, who publishes another report on the results of her breeding experiments with mice. She has succeeded in breeding a strain in which trauma is followed with exceptional frequency by the development of malignancy. Mr. Sampson Handley contributes a paper in which he develops his interesting views on the rôle of lymph stasis in the genesis of cancer. Prof. Roussy, of Paris, discusses the subject of epithelial metaplasia and its relationship to new growths. Dr. William B. Coley writes on Multiple Myeloma. He states that these tumours are extremely sensitive to both the toxins of erysipelas and *B. prodigiosus* and to radiation, and that no case of multiple myeloma should be given up as hopeless without a prolonged trial of both toxins and radiations.

The second part of this volume contains three papers on Hodgkin's disease by Dr. F. W. Stewart, Prof. A. S. Warthin, and Dr. E. l'Esperance. Other papers in this section which deserve special mention are by Prof. Maisin, on the effect of different diets on the development of tar cancer in mice; by Prof. Carter Wood, who demonstrates the advantage of using animal tumours as a material for testing therapeutic methods, especially radiotherapeutic methods for the treatment of cancer; and by Prof. O. Warburg, who in two brief pages elucidates a complex biochemical phenomenon concerning the respiratory ferment.

The third section, on regional cancer, contains several contributions on cancer of the breast by Prof. Bloodgood, Dr. Burton Lee, Dr. B. F. Schreiner, and Dr. M. Leu. Of special interest is an illustrated description by Dr. M. Cutler of transillumination of the breast; this method seems to be a really practical aid in the differential diagnosis of pathological conditions of the breast. Dr. Howard Kelly stresses the advantage of electrosurgery in gynæcological operations. Prof. Regaud, of Paris, gives an account of an atypical type of cancer of the uterine cervix, which though observed by him in 8 per cent. of all cases of epidermoid cancer of the cervix, has not hitherto been described. Dr. Barringer writes on carcinoma of the prostate, discussing its early diagnosis and comparing the results of treatment by surgery and by radiation. Dr. H. C. Saltzstein and Dr. D. J. Sandweiss discuss the commoner difficulties in diagnosis and treatment of cancer of the rectum and colon.

The last part of the volume, on radium and roentgen ray therapy, will be of special interest to clinicians. The results of radiation therapy in cancer of the uterus obtained in five different centres are reported in papers by Dr. Heyman, of Radiumhemmet, Stockholm, Prof. Wintz, of Erlangen, Dr. Lacassagne, of Paris, Dr. W. P. Healy, of New York, and Dr. C. F. Burnham, of Baltimore. Sir Charles Gordon Watson discusses to what extent radium can replace surgery for cancer of the rectum. Prof. Lazarus Barlow describes the clinical results observed by him in the treatment of cancer cases by a large amount of radium (5 g.). The application of X ray therapy in breast cancer is discussed in a paper by Dr. G. E. Pfahler and Dr. L. D. Parry, who base their conclusions on a statistical study of 977 private cases treated by them during the period 1902–1927. Their figures show a remarkably high percentage of five-year recoveries and seem to demonstrate a high therapeutic value for post-operative irradiation. Dr. R. E. Herendeen contributes an interesting paper on X ray therapy of giant-cell tumours of the bone.

The subjects dealt with in this volume, while restricted to cancer, include very different aspects of this complex problem, many of them of paramount importance at the present time. The high standard reached by the contributions renders this volume a worthy tribute to Dr. Ewing whose life has been devoted to a study of cancer and who is regarded with affectionate esteem by his colleagues in all countries.

The Concentric Method in the Diagnosis of Psychoneurotics.

By M. Laignel-Lavastine, Professeur Agrégé à la Faculté de Médecine de Paris, Médecin de l'Hôpital de la Pitié. London: Kegan Paul, Trench, Trübner and Co., Ltd. 1931. Pp. 217. *10s. 6d.*

Prof. Laignel-Lavastine's name is familiar to English physicians and psychopathologists largely through his work on the sympathetic disturbances which are registered in the so-called functional nervous diseases. This collection of essays is intended to stress the importance of a clinical approach to the study of the psychoneuroses. The author's thesis is that diagnosis can only be accurately arrived at by regarding the manifestations as a series of concentrically arranged phenomena, psychological, physiogenetic, and organo-lesional; that is to say, we must work from without inwards—through the psychological-behaviour layer to the neural-sympathetical substratum—hence to the endocrine subsoil, and finally to the organic "*morbific kernel.*" This approach is a salutary one. It is good that the general physician should realise in every case a set of psychic determinants—conscious and subconscious, and that the clinical psychologist should not turn his back upon the various physical "sets" from neural to deep organic lesional. The descriptions are diagrammatic, and though they gain in lucidity of exposition, they lose the dynamic interpenetrating processes which unify yet keep fluid the various systematised layers of the organism. This over-simplification in terms is dangerous and shows itself very clearly in the scholarly chapter which relates the mystical states to the mental changes in psychasthenia and the schizoid types. While it is illuminating to bring out the formal relations between neurosis and mystical ecstasy, it is psychologically more important to bring out the dynamic relationships of the states themselves to their deeper roots. The chapter on treatment is very catholic and healthy, though the remarks on the Freudian theories and practices show prejudice. Dr. Vinchon adds a lecture on the Devil, which is not very informative.

The Psychology of Insanity.

Fourth edition. By Bernard Hart, M.D., F.R.C.P. Lond., Fellow of University College, London. London: Cambridge University Press. 1930. Pp 176. *3s.*

Dr. Hart's little book early attained to a popularity that is not likely to diminish with the appearance of this fourth edition; works of the kind are seldom so lucid and compact. It remains essentially unchanged, but an introductory sketch has been added on the development of the chief schools of psychopathology, especially the Freudian. Dr. Hart's method is frankly eclectic; whatever doubts there may be as to the adequacy of such a method for more detailed presentations, there can be none about the simplicity and readableness of this short work.

Le service social à travers le monde.

By Dr. René Sand. Paris: Librairie Armand Colin. 1931. Pp. 250. Fr.25.

The author, who is Technical Counsellor to the League of Red Cross Societies and Chairman of the International Hospital Committee, has taken good advantage of his central international position to study social work. In what may be described as a vertical section, he traces the development of social work from Babylonian times to those of Edwin Chadwick. Then, in a horizontal section, he shows what is being done at the present time in various countries, devoting one chapter to France, another to Germany, a third to Great Britain, and so on. Finally, he shows how all the various social phases through which humanity has passed from ancient to modern times can still be studied to-day in different parts of the world. He rings the changes on happiness and misery with swift dramatic touches; the world is vastly better than it was in many respects, and while in the time of Louis XIV. half of the inhabitants of France, the richest country in the world at that epoch, were crushed by economic misery, only some 3 per cent. of the inhabitants of Western Europe are to-day in need of public support. On the other hand, there are still some 5,000,000 persons living in slavery in our own times, and within two days' journey of Marseilles woman may be studied as a beast of burden, her husband her master, and her children unprotected and untaught. After sketching a programme of social service, Dr. Sand holds it up with a pensive gesture and asks if his critics find it chimerical. He forestalls this objection with the defence that no reform has yet been introduced into the world which has not promptly been condemned as Utopian.

The Vitamins.

Second edition. By H. C. SHERMAN, Mitchill Professor of Chemistry, Columbia University; and S. L. SMITH, Senior Chemist, Office of Experiment Stations, U.S. Department of Agriculture. New York: Chemical Catalog Co. 1931. Pp. 575. $6.

THE new edition of Sherman's Vitamins is essentially a book for students. The account is revised up to 1930 and the history and chief lines of development of knowledge concerning each vitamin are fully but concisely sketched. More than a third of the space is devoted to an extremely full and useful bibliography. The book is not easily readable by the uninstructed reader and it is far too advanced for the ordinary medical student; but the research worker will appreciate it as a valuable work of reference.

Birth Registration and Birth Statistics in Canada.

By ROBERT R. KUCZYNSKI. Washington, D.C.: The Brookings Institution. 1930. Pp. 220. 14s.

THE foundations of Canadian vital statistics were laid in the opening years of the seventeenth century. In addition to a survey of the birth statistics through three centuries of time, this little book provides a discussion of the problems and difficulties which beset vital registration before the (comparatively recent) establishment of the Dominion Bureau of Statistics, and the introduction of more or less uniform methods of procedure. An analysis of the natality data suggests that the fecundity of French-Canadian women has decreased in recent years; fecundity of British-Canadian women is about as low as that prevailing in most other countries of western civilisation, being lowest in Ontario and the Maritime Provinces where the British element predominates.

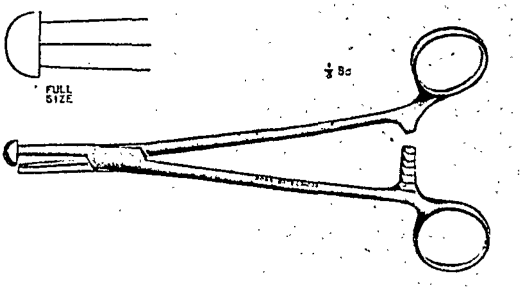
British Journal of Children's Diseases.

Vol. XXVIII. (April-June) contains a paper entitled Is the Hæmolytic Streptococcus Acceptable Epidemiologically as the Ætiological Agent of Scarlet Fever? Drs. T. Toyoda, C. Kuroi, J. Moriwaki, and Y. Futagi, of the Japanese Government Isolation Hospital, Darien, come to the conclusion that the principal factors in the production of scarlet fever are (1) hæmolytic streptococci possessing the capacity of producing Dick toxin, (2) sufficient virulence on the part of the streptococci, and (3) a body with a constitution highly susceptible and suited to the propagation of hæmolytic streptococci.—Dr. E. Ashworth Underwood, who contributes a paper on Early Nephritis in Scarlet Fever, with the report of a personal case, remarks that very few cases have been recorded in which nephritis has supervened within the first three days of the disease. His patient was a girl aged 16, in whom definite acute nephritis developed on the second day of scarlet fever, if not earlier, and showed a recrudescence during each of three attacks of tonsillitis in convalescence. On her discharge from hospital after a stay of 183 days, the urine had been normal for a fortnight. Four year afterwards, however, the patient was reported to be suffering from chronic nephritis. Underwood suggests that the *Streptococcus scarlatinæ* caused the initial nephritis which was of a mild glomerular type and that this lesion was supplemented by acute interstitial nephritis which ultimately became chronic and involved other renal elements.—In a paper on the Onset of Acromegaly before Fifteen Years of Age, Dr. F. R. B. Atkinson has collected in chronological order 32 cases of which he subsequently rejects seven, leaving 25 in which the first signs of acromegaly appeared between the ages of 7 and 14 years. No particular cause seems to have precipitated the onset of the disease, although in one instance it seems to have begun after measles and in another after shock.—In a paper entitled Pædiatric Eponyms III. Koplik's Spots, Dr. W. R. Bett reproduces the original descriptions of this pathognomonic sign of measles with a short life and portrait of the discoverer.—Dr. F. Parkes Weber records a case of Osteochondroma Enclosing the Left Kidney and Suprarenal Gland in a Girl aged 15 Years, in which it was doubtful whether the tumour of the femur or that around the kidney and suprarenal was the primary growth.—The abstracts from current literature are devoted to alimentary diseases.

NEW INVENTIONS

PHRENIC AVULSION FORCEPS.

IN performing the operation of phrenic avulsion the phrenic nerve is exposed in the neck under a local anæsthetic and grasped by fairly strong forceps. The nerve is then divided above the forceps and pulled slowly out from the chest cavity. The avulsion has to be very slowly proceeded with so that the nerve will be removed in as great a length as possible. If it is pulled out too strongly or too quickly the nerve may break. If this breakage occurs above the communicating branches which reach it below the clavicle, the diaphragm will still receive nerve impulses from these branches, so that the operation will be useless. By experience one finds that the best way of controlling this gradual pull on the nerve is to rotate the forceps and wind the nerve on to them very slowly. If ordinary forceps are used, the nerve slips off the end, since the forceps cannot be kept on the same plane as the nerve which lies at the bottom of the fairly deep wound. To overcome this minor difficulty the forceps herewith illustrated were devised. The round tip projects from the edges of the blade, thus preventing the nerve from slipping over it. The blades themselves have longitudinal grooves assuring a good grip of the nerve. The forceps should be of a fairly heavy type as this ensures a firmer and more complete control of the amount of force required.



Messrs. Down Bros., Ltd., 21 and 23, St. Thomas's-street, London, S.E., are the makers.

WALTER MERCER, M.B., Ch.B., F.R.C.S. Edin.
Edinburgh.

THE LANCET.

LONDON: SATURDAY, JUNE 27, 1931.

THE INDIAN MEDICAL SERVICE.

APPLICATIONS are invited by the India Office for permanent commissions to the Indian Medical Service. The terms offered include a gratuity of £1000 on retirement after six years' service or one of £2500 after 12 years' service, together with free return passages for those who no longer desire to remain in the service. The Indian Medical Service, it is stated, offers wide opportunities of medical experience, including clinical, preventive, specialist, and research work. At the beginning of his career the officer is employed on the military side, which has medical charge of the Indian Army; but after one year's service in India he may apply to have his name registered for transfer to the civil side, from which appointments are made to surgeoncies established at the principal centres to provide for the medical needs of officials and for general medical administration. The appointments available include special public health and bacteriological posts, research assistantships, and chairs at the medical schools. Anyone who has seen the work of the I.M.S. in India, or even anyone who has been given the opportunity, as we have been given, of attending year by year the June gathering of senior officers in London, must have been struck by the part which these civil appointments have played in the life and work of the service. They have given variety and fascination to work which would otherwise have been largely of a routine or official character, have provided careers of scientific distinction and renown far beyond the bounds of India or of the British Commonwealth, and have produced habits of mind enabling fine administrative work to be carried on after retirement from the service. It has been said that were civil employ in the service to be abolished there would be a rush of retirement from the already depleted ranks, and a corresponding dearth of recruits. It is therefore an ominous note which has been added to the advertisement to which we have referred: "It is not possible to state at present what, if any, prospects of employment on the civil side will be open to Indian Medical Service officers under the proposed new constitution of India."

The doubt is documented by the report of a subcommittee of the Indian Round Table Conference, appointed to consider the relation of the Services to the new political structure in India. While this subcommittee felt it necessary to provide guarantee in the new constitution for the maintenance of rights and safeguards for existing members of the service, and "to take such steps as are necessary to reassure existing members of the services with a view that they may serve with loyalty and efficiency for their normal term," they express the opinion tersely that in future there should be no civil branch of the Indian Medical Service. As a corollary of this recommendation no civil appointments, either under the Government of India or the Provincial Governments, would in the future be reserved for Europeans as such. It is true two members of the subcommittee, Lord ZETLAND and Sir EDGAR WOOD, expressed a fear that under the scheme proposed neither the Provincial Governments nor the Indian Medical Service would secure European medical officers of the type required. They would prefer to see the present arrangement continued until Indianisation, both in the Indian army and in the civil services, has proceeded further; but these two voices were a small minority in a committee of 34 persons. The Round Table Conference, while admitting the report as provisional, regarded it "as material of highest value for use in the framing of a constitution for India." The Prime Minister was perhaps a little more guarded in describing the subcommittee as having "explored the position as regards the future." It is difficult to think of this abolition of the civil side as being already a foregone conclusion when its retention is regarded by the European officer not only as the sign and seal of his best work, but as equally desirable to whatever extent the service becomes Indianised under the new constitution. It is, we believe, a fact that the many Indian officers now in the service also regard the possibility of transfer to the civil side as a valuable privilege.

It should act as a corrective to any premature feeling of despondency when it is recalled that there has hardly been a period within the recollection of the present generation when the future of the I.M.S. did not appear to be hanging in the balance. Common report had it at one time that Lord KITCHENER, in his exceptionally powerful position as Commander-in-Chief in India, had come to the conclusion that radical alterations in the constitution of the service were essential. The Verney Commission and the Lee Commission have sat in judgment on it, and made divergent recommendations, which, as regards any general reorganisation, were never carried out. In 1925, Lord BIRKENHEAD, as Secretary of State for India, stated the Government's conclusion that the I.M.S. ought to remain for military reasons, its reserve being secured from officers lent by it to the civil administration—that, in fact, the leading characteristics of the service should remain much as of old, it being understood that Indianisation should proceed as rapidly as convenient, and that civil opportunities would necessarily diminish. The service has survived many attacks, some of them from apparently irresistible critics, and the persistent—at times unreasoning—optimism of its friends has on the whole been justified. Great improvements in the conditions of service have been introduced, and most of the evils prophesied have so far failed to materialise. The past year, however, has brought portents the world over, and in India particularly everything seems to have gone into the melting-pot. It is clear that far-reaching burden, her husband her master, and her children unprotected and untaught. After sketching a programme of social service, Dr. Sand holds it up with a pensive gesture and asks if his critics find it chimerical. He forestalls this objection with the defence that no reform has yet been introduced into the world which has not promptly been condemned as Utopian.

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THE foundations of Canadian [illegible]
laid in the opening [illegible] a further contribution to
In a[illegible] of the blood cholesterol in the various
types of kidney disease (see p. 1390). Dr. FLEMING has examined some 60 cases of both acute and chronic nephritis in the hope of finding variations in plasma cholesterol sufficiently constant to be of practical help in prognosis and diagnosis. Briefly summarised, his conclusions are that the blood cholesterol is raised in cases of chronic parenchymatous nephritis (subacute nephritis), frequently in acute nephritis, and "constantly" in arteriosclerosis with renal disease. In other types of nephritis the figures are variable. The association between hypercholesterinæmia and "subacute nephritis" has long been known, although their exact relationship is far from understood. These cases show the picture of œdema, albuminuria, usually a diminished urine output, and a raised blood cholesterol. One type of case with these characteristics is classed as nephrosis by many workers; here the blood cholesterol may be very high indeed and lipoid deposits are found post mortem in the kidneys. Cases are recorded showing figures as high as 780 mg. per 100 c.cm., against a normal of 160–200 mg. The pathological condition does not, however, appear to be produced primarily by the excess of cholesterol, and œdema in particular is not entirely dependent upon this excess. Thus FLEMING notes in his cases the absence of œdema in some patients of this type whose blood has a high cholesterol content, and he notes also the tendency of the cholesterol in the blood to rise as the general condition improves. It is probable that a mere increase of lipoids in the blood is neither the cause nor the effect of the

fortnight. Four year afterwards, however, the patient was reported to be suffering from chronic nephritis. Underwood suggests that the *Streptococcus scarlatinæ* caused the initial nephritis which was of a mild glomerular type and that this lesion was supplemented by acute interstitial nephritis which ultimately became chronic and involved other renal elements.—In a paper on the Onset of Acromegaly before Fifteen Years of Age, Dr. F. R. B. Atkinson has collected in chronological order 32 cases of which he subsequently rejects seven, leaving 25 in which the first signs of acromegaly appeared between the ages of 7 and 14 years. No particular cause seems to have precipitated the onset of the disease, although in one instance it seems to have begun after measles and in another after shock.—In a paper entitled Pædiatric Eponyms III. Koplik's Spots, Dr. W. R. Bett reproduces the original descriptions of this pathognomonic sign of measles with a short life and portrait of the discoverer.—Dr. F. Parkes Weber records a case of Osteochondroma Enclosing the Left Kidney and Suprarenal Gland in a Girl aged 15 Years, in which it was doubtful whether the tumour of the femur or that around the kidney and suprarenal was the primary growth.—The abstracts from current literature are devoted to alimentary diseases.

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diabetes has been attributed to the increase in blood lipoids; the association has, however, not been generally accepted as cause and effect. There are so many pathological and experimental factors which can influence the cholesterol of the blood, either as a whole or in the relation of its "free" and "combined" fractions, that the subject is even more complex than other biochemical ones. Dr. FLEMING confirms the work of others in noting a fall in cholesterol in the blood in uræmia, and believes that a single estimation is of value in the diagnosis of this condition; but the fall is relatively slight and a larger series of cases would be necessary to convince us that this finding has great diagnostic value. It is manifest that the cholesterol variations during the progress of nephritis in general require further study before any final conclusions can be drawn.

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THE HEATING OF HOSPITALS.

THE comfort of patients in hospital is much affected by the system of heating which is adopted, and hospital committees are increasingly adopting up-to-date methods. The open fireplace is no longer practicable as a means of warming large buildings, although most people agree that they should be provided as a centre of cheerfulness in a ward or a day-room, in the nurses' recreation rooms, and in the sitting rooms of the matron and the resident medical officers. Low pressure hot water has long been the usual heating system adopted in this country, and it has many advantages. First-class engineers still claim that until some other method has been proved to be superior no committee should be advised to risk a change. There is however a growing feeling that radiators and distributing pipes are unnecessarily ugly and unhygienic. This can be met to some extent by the intelligent placing of radiators, which should be in recesses under windows wherever possible, and by the concealment (as in America) of flow and return pipes in chases or spaces which are accessible but not visible. If these precautions are taken and the radiator is not too near the patient's head there is not much to be said against the method, and the matron of one of our largest hospitals recently gave it as her opinion that the combination of radiator and open window was most conducive to comfort. Fresh-air inlets behind the radiator become a nuisance from trapping dust. The horizontal flow-pipe a few inches above floor level may be economical and even useful as a bed-stop, but it requires constant dusting and spoils the appearance of a ward. These objections can be met by putting the pipes in the thickness of the floor, but a better method is to feed the radiators on the so-called drop system when the vertical pipes can be concealed in piers or chases.

New methods now coming to the front may some day supersede the radiator system. Pipes of small bore may be embedded in the walls or ceiling, more generally the latter. This panel system gives a radiant form of heat in place of the convection of the radiator. The wall or ceiling is gradually warmed, an even temperature is the result, and there are no pipes or radiators to be seen. The advantages of panel heating for hospitals are so obvious that there must be cogent reasons why it is not generally adopted. First the cost of installation is considerably higher than that of the radiator system, and running costs also appear to be higher. There is also a fear that should the panels prove defective they will be expensive to cut out and replace. These objections are partly met by a radiator, which has been placed on the market (known as the Ray-Rad) with a smooth iron surface towards the room and insulating material behind to prevent the heat being absorbed by the wall. These may be arranged as a continuous dado or as panels in the wall. A drawback is the fact that the heating surface must be two or three times as large as the ordinary radiator to produce the same result. In the operating theatre, where it is of first importance to avoid dust-traps, the panel system and the flat radiator should be considered. Here high temperatures are required at short notice, and auxiliary heating with steam or electricity is required.

Electric heating will no doubt come with the cheaper supply of current; hitherto the cost has been against it except in special cases. Such forms as the "Unity" tubular or the "Morgan" panels are suitable where routine methods prove difficult. In private wards a radiator under the window and an electric fire for cheerfulness are the handiest combination, although a gas or coal fire may be preferred. In the hospital kitchen gas more than holds its own. The choice between oil or solid fuel concerns hospital committees very deeply, but can only be settled individually with the advice of competent engineers.

THE GENEVA CONFERENCE ON NARCOTIC DRUGS.

ALLUSION was made in THE LANCET of May 23rd (p. 1146) to some of the difficulties with which the conference, now in session at Geneva, on the international control of the commerce in dangerous drugs would find itself confronted. The conference was opened on May 27th, and in the public discussions which began the next day the nationalisation of the drug traffic trade was advocated by the delegates from Argentina and Roumania. The Italian delegate argued for the right of any country to manufacture for its own needs if it so desired, and to choose the country from which it might desire to import. The British delegate, who was largely responsible for a draft convention which had been prepared, supported what is known as the quota scheme, whereby each manufacturing country should be allotted an appropriate share in supplying the legitimate medical requirements of the world. He urged that no other scheme that was generally workable had been put forward. The Persian delegate pleaded for the application of the quota system to the production of raw opium, a contention which illustrated the difficulty of effectually dealing with the restriction of dangerous drugs to medical uses without paying regard to the limitation of production of their raw materials.

On June 19th the British delegate (Sir MALCOLM DELEVINGNE) announced that it was impossible to frame an agreed text combining the quota scheme, which he supported, and an alternative proposal of Franco-Japanese origin. The latter sought to limit the manufacture of narcotic drugs by any country to its annual estimate for domestic requirement and for export to meet firm orders duly certificated, while provision was to be made for some reserve and for Government stocks. This somewhat complicated scheme was adopted, subject to certain conditions, by the Committee on Limitation as a basis for discussion by 14 votes to 2 with 6 abstentions. Such diversity of opinion on so fundamental a question is not reassuring. Nor does it augur for the chances of reaching general agreement on the form of a convention which would secure ratification by all the Powers concerned. The lamentable results of failure to ratify, or to put in force, the previous opium conventions of The Hague (1912) and Geneva (1925) have been already emphasised in these columns

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THE INCORPORATED MIDWIVES' INSTITUTE.—The jubilee celebrations to be held next week will include meetings at the Institute on July 3rd, when Mr. Baldwin will be present; at Bedford College, when Lady Salisbury will present the Jubilee Fund to the Institute, and Mr. Comyns Berkeley will speak; and at the house of the Royal Society of Arts, London, W.C., where a conference will be held. The Jubilee Fund, which has now reached the sum of £1400, has been collected by members and friends of the Institute to develop its activities and to provide a nucleus towards new pensions. The conference will discuss the relationship of the midwife under a national maternity scheme to the Central Midwives Board, to the Insurance Committee, and to the British Medical Association. Representatives of these bodies will speak and the subsequent discussion will be open to all midwives.

ANNOTATIONS

COLONIC THERAPY.

THE introduction of substances into the colon by way of the rectum is probably as old as constipation. To introduce fluids two main methods are employed, which may be called the high pressure and the low pressure. The former is more practised on the other side of the Atlantic than in this country, and has an enthusiastic advocate in Dr. Fred D. LaRochelle. He advises[1] colonic lavage with the patient sitting on an ordinary lavatory seat, the fluid entering through a plated brass tube 22 in. long, bent in such a way as readily to adapt itself to the conformation of the body and with a tip which can be detached for cleaning. The liquid, which comes from a three-gallon reservoir, seven feet above the floor level, is forced into the rectum by hydrostatic pressure until a sense of fullness with a desire to move the bowels is experienced; the sphincter is then relaxed and the bowels moved in a very nearly natural manner without moving the tip or shutting off the flow of liquid. When evacuation has taken place the sphincter contracts again around the tip of the tube and the process is repeated. Five gallons are the usual quantity, though two to three times that much can be used. Dr. LaRochelle regards his procedure as assisting nature, and claims that when a mixture of soap and water is forced into the rectum and sigmoid under sufficient pressure the bowel is distended and made to contract; if expulsion is resisted at the sphincter the wave will turn and move up the colon, eventually reaching the cæcum. Although this may be so in many cases, it would appear more probable that when colic spasm is present, the initial downward pressure would cause a relaxation of the sphincter, before the splenic flexure was passed, and the cæcum would not be reached. In any case the use of such large amounts of fluid appears unnecessary. With any enema the cæcum is the slowest part of the bowel to empty, and relies for its evacuation on the natural mass movements of the colon. This clearing is slower than normal in a sluggish bowel. Granted that the cæcum is reached and filled by the first rush of fluid, it is doubtful if real emptying would take place till after the treatment had finished. The main part of the excess fluid would merely pass in and out of the lower bowel, without reaching or disturbing the contents of the bowel between the apex of the cæcum and the splenic flexure. Although the author claims over a thousand treatments without accident, the method can hardly be held altogether devoid of risk. In this country the low pressure method is preferred. The patient lies on the left side and a No. 12 or 14 rubber catheter is inserted 3–4 in. into the rectum, 20–30 ounces of fluid being run in slowly while the patient breathes deeply. The catheter is then removed and the patient lies quietly for two to three minutes before getting into the knee-elbow position and later on his right side, taking eight to twelve deep breaths in each position. About five minutes later the patient clears the bowels in the ordinary position. If there is difficulty in holding the full amount, the flow is stopped when tolerance is reached and the knee-elbow position assumed at once. The fluid is given at a height of 18–24 in. and the procedure is repeated ten minutes later. Given in this way opaque enemata can be seen on the screen to fill the cæcum, often even to invade the terminal part of the ileum, and, what is more important, to empty within a reasonable time. It would seem that this is a safer and more physiological method than the one described by Dr. LaRochelle.

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[1] Amer. Jour. Surg., 1931, N.S., x., 496.

CELL STIMULATION.

CONSIDERING how much of the attention of pathologists is taken up in observing the effects of various agents on the activities of cells, it is rather remarkable that relatively few attempts are made to investigate the matter by the methods of experimental analysis by which alone we can hope to get to the bottom of the phenomena. Some time ago Dr. J. S. Young, of the Cancer Research Department of the University of Leeds, found that active proliferation of the epithelial cells lining the marginal alveoli of the lung of the rabbit could be produced by injecting various electrolytes into the pleural cavity, and he has used this preparation for a systematic investigation. The reaction depends on the anion of the salt used and the efficacy of this varies with the valency, calcium or strontium being more active than sodium and less active than aluminium. The heavy metals also fall into a regular sequence which is, in order of efficiency, mercury, silver, copper, cadmium, lead, zinc, and appears to run inversely with their solution pressures. Taking all the facts together, Dr. Young points out that there is a remarkable parallelism between the stimulation of cell proliferation and the circumstances which determine the precipitation of negatively charged colloids. In his latest paper[1] he deals with the effects of repeated injections and raises questions of great interest to dermatologists and others concerned with chronic irritations. Active hyperplasia of the alveolar epithelium is regularly produced by the injection of a three-quarters normal solution of strontium chloride; the reaction reaches a maximum on the third day and has passed off by the eighth day. If a second injection is given between the second and tenth days there is no intensification of the response though the involution of the primary response is somewhat delayed; between the tenth and twentieth days a second dose has no effect at all. After this the cells become more susceptible again, and after about a month respond as vigorously as to a first dose. This temporary resistance is obviously a curious phenomenon. It is local in that it cannot be caused by injecting strontium chloride intravenously or intraperitoneally, and it is not wholly specific, since a primary dose of calcium chloride induces resistance to a subsequent injection of strontium chloride. On this point of specificity it would be interesting to have more ample information as to the mutual effects of substances differing more from one another chemically than calcium and strontium. It is tempting to suppose that the resistance is an inherent property of young new cells, not yet fully mature and normally reactive. Dr. Young seems to dispose fairly satisfactorily of this idea by showing that by starting a series of injections with very dilute solutions and progressively increasing the strength the cells can be made resistant without having at any time showed any reaction. An alternative hypothesis supposes that a cell is presumably stimulated by any substance because it contains something which can combine with that substance.

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[1] Jour. Path. and Bact., 1931, i., 357.

In the reaction the receptor material is used up and the cell becomes irresponsive in consequence. In about three weeks the receptors have been regenerated and the cell once again becomes susceptible. These considerations will no doubt be further analysed by Dr. Young, and we await the results with interest.

PICTURES, POPULAR AND UNPOPULAR.

MAGISTRATES and social workers are constantly heard to deprecate the effect of the cinematograph entertainment on the youth of the country; sanitarians deplore the hours spent in dark, crowded, and often ill-ventilated halls when they might be spent in open-air exercise; pedagogues bewail the prostitution of a potential weapon for instruction. Say what they will, the cinema has taken such hold of the public throughout the world that it has almost certainly come to stay. To all complaints about the character of the films exhibited, the business men controlling the industry reply that they must give the public what the public wants. According to them the public wants drama, glitter, and romance, and the cinema is therefore perpetuating the tradition of the Victorian novel which ended: "They married and lived happily ever after." Medical psychologists know some of the appalling damage done to national life and the home by the easy assumption that the wedding bells ring out the period of struggle and anxiety and ring in a halcyon period of effortless delight. The leaders of the cinema world are not likely to be much moved by the plea of the pedagogue or the medical psychologist, but startling changes might follow if it were possible to convince them that they have misinterpreted the real edict of their god, public opinion. A copy of the report of the Birmingham Cinema Enquiry Committee[1] should be sent to every cinema manager in the country. The report contains no argument, no conclusions; it merely consists of the summarised results of a series of questionaires addressed to children, adolescents, and adults. Many interesting figures and comments were elicited. Of 1439 children between the ages of 8 and 14, 780 went once a week to the pictures, 184 went twice a week, 107 went once a fortnight, 302 went once a month or occasionally, while 30 never went and 36 went three, four, or five times a week. A boy of 11 remarked, "You have them on your mind all the time." A report from groups of 150 club girls, past school age, showed an average attendance of once or twice a week. Asked why they liked going, the children replied under four main headings: for interest, for amusement, to pass the time, and for excitement or thrills. The "comics" held an undisputed first place in their affections, followed by adventure pictures and detective films. Love stories are not even mentioned by the boys, except in such remarks as "We like any kind but love," or "Pictures are all now potty love ones." A notable feature is the constantly recurring emphasis on crime and war. A group of girl guides aged 7 to 10 put murder films first in their choice and "comics" second. Many of the children wrote of the fear that crook and war plays had caused them. They did not think the shows were too long—except a few who replied "Only love pictures are too long." In view of Mr. Savin's interesting paper on the incidence of fatigue in the cinema in our present issue (p. 1433), it is worthy of note that 442 of the children found that the pictures tried their eyes. Over 350 had trouble in sleeping afterwards—often on account of fear or nightmare. Asked what they had learnt from the pictures, the children gave a series of replies ranging from "That Quaker Oats is very nourishing," "American slang," "How to talk and to be chilvarus," to "What life really is," "Never to take a big risk," "Discontent," "That actresses do not wear enough clothes," and "That it is a hard job for the police to catch their culprits." One boy of 13 said he had learnt nothing at all except the art of love, and several others gave similar replies, including "How to love and to murder people at the same time." The references to murders are incessant, and many say "I have learnt nothing but murder," or "I have learnt to shoot through my pocket." There are scores of suggestions for improvement: that the entrance should be cheaper and the performance longer, that "rood" pictures should be excluded, that murders should be left out, that there should be more news, more comics, and more fairy tales, and (from several) that babies and smoking should be forbidden. Similar questions were answered by groups of young adults: club girls, guides, factory workers, adult school students, and business people. The majority of these went to the cinema once a week and gave as their reason "recreation." Young men voted for the same films as the boys, and objected to sloppy and suggestive films. They asked for more ventilation, orchestras, and "real" life in the pictures. The girls object to smoking and babies, and suggest that all seats should be booked and queues abolished. They say there is too much sentimentality and too much kissing. They like historical and nature films as well as adventure, comedy, history, and detective pictures. They do not seem to have learnt anything of great educational value, except from travel and nature films and the news. The report closes with the opinion of magistrates, teachers, doctors, business men and women, artisans, clerks, undergraduates, and social workers on 285 films which they have inspected. It forms an interesting supplement to the report on the inquiry addressed to school-children and to teachers in various countries by the International Educational Cinematographic Institute which dealt chiefly with the educational value of films.[2]

CARCINOGENESIS.

THE report of the Yorkshire Council of the British Empire Cancer Campaign for 1930–31 contains accounts by Prof. R. D. Passey and Prof. E. Mellanby on work done at Leeds and at Sheffield. In the laboratories at Leeds Dr. J. S. Young has continued his investigations on the production of experimental hyperplasia by allowing certain electrolytes to act on the cells, and has come to the conclusion that the onset of epithelial hyperplasia conforms to the same principles of physical chemistry as those which regulate the precipitation of negatively charged colloids. A precipitation of such colloids in the cell membrane is therefore considered to be an essential phase in the process which culminates in cell division, and perhaps to initiate cell division. Dr. Berenblum's observations on the anticarcinogenic action of mustard gas have been continued with the object of determining whether this effect is due to an excessive irritation, involving cell damage, or whether there may not be some specific chemical or physico-chemical action of mustard gas on the cell itself to account of the cervix, and (in Cochin-China) of the buccal mucosa, are abnormally common. An interesting point is that epithelioma is four times as frequent as sarcoma. There can be no doubt that careful observations on the incidence of cancer in native races will disabuse our minds of many false impressions founded only on casual statement or copied from one text-book to another. But the difficulties of controlling diagnosis by biopsy and of arriving at accurate statistics among native patients must be remembered before any general conclusions are drawn from such observations.

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[1] Report of Investigations, April, 1930, to May, 1931. Secretary of Committee, B. J. Woods, 85, Russell-road, Hall Green, Birmingham. Pp. 31. 2*d*.

[2] See The Times, June 24th, p. 14.

TUBERCULOSIS AT BREST.

ACCORDING to Médecin-en-chef (Surgeon Captain) Cristol[1] of the French Navy, the great problem of to-day in naval hygiene is tuberculosis. In France, Brest is the port specially concerned, Toulon in the south being much less affected. This, Dr. Cristol thinks, is because Provence has always been a highway constantly exposed to infection, whereas Brittany, away in a corner, only began to be opened up and infected 40 years ago. He quotes the surprise of an old Breton practitioner, recently dead, at the "new disease," much in the same way as native chiefs in German East Africa were registering surprise about 1905 at the phthisis brought to their country by Indian immigrants.[2] Forty years ago, but especially from 1900–10, healthy rustics living on farms, their food poor but fresh, with little risk of infection in the country and so escaping disease, began to flock into Brest, lured by hope of high pay, where they often succumbed when deprived of their fresh food and exposed to an infection against which they had acquired no immunity as children. Auffret was the first physician to appreciate, at Brest in 1896, what was happening. He segregated the tuberculous in wards by themselves, insisted on careful examination of the dockyard men at entry, and got leave to invalid from the dockyard workmen found attacked. In the early stage of Breton infection nearly all the cases were acute (Collis's "natural" type) but now far more are chronic and the mortality is less. Dr. Cristol explains similarly why stokers in the French navy suffer more than other ratings from phthisis; it is because their work requires men of the best physique, and these come in greater proportion from the unimmunised farm hands. Dockyardmen at Brest are received into the naval hospital just as are naval seamen, but when sick at home have to find their own doctoring. Dr. Cristol submits that, as the new French national health insurance is to include care for dependants, the Navy should put naval surgeons in charge of dockyardmen at their homes, thus controlling infection all along the line. These officers would popularise B C G inoculation of infants, the success of which he says (without giving figures) "declares itself more and more." At Brest deaths have fallen off more in the dockyard than in the town. In 1911 the death-rate was 7·1 in the dockyard, 6·0 in the town; in 1926–28 it was higher in the town. Here housing is a difficulty. In 1906, 53 per cent. of families lived in one-roomed houses, of which some (nearly 2 per cent.) had not a single window, and yet lodged up to five persons. Things are better since the war; there are fewer workers in the yard, less pressure on house accommodation, and two housing schemes have been completed; while the generous pensions to men tuberculised in the war have enabled them, as Dr. Cristol has satisfied himself, to live in roomier houses than before. Food too is better since the war; the dockyard canteen feeds, cheaply and well, 1400 men daily. The men drink less and wine is replacing spirits. The growing taste for sports keeps them out of the small dirty cabarets in which they must often have become infected. Dr. Cristol's demographic study, which covers 100 pages of the journal, will no doubt be keenly discussed.

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[1] Arch. Méd. Nav., 1930, pp. 403 and 477.

[2] See THE LANCET, 1929, ii., 1153.

THE NEGATIVE PHASE IN ANTIDIPHTHERIAL IMMUNISATION.

COMMENTING on a paper by Dr. Richard Prigge, to which we recently drew attention,[1] Dr. J. Siegl, of the Vienna University Children's Clinic, maintains that the experiments carried out by Prigge on guinea-pigs do not justify any conclusions as to the absence of increased susceptibility to infection after immunisation in man, as his own observations as well as those of Basch have demonstrated the contrary.[2] According to Siegl, the only conclusion that could be drawn from such experiments was that the inoculation of small doses of the formolised vaccine did not reduce the resistance of immunised individuals, whereas larger doses might be followed by a diminution of resistance. The latter should not be regarded as a negative phase but as evidence of systemic damage. In his reply, which is appended to Siegl's criticism, Prigge retorts that his investigations proved that antidiphtherial inoculation did not involve any increased susceptibility to diphtheria, and that observations relating to the not infrequent oscillations of the antitoxin titre in adequately immunised individuals were of secondary importance, as such individuals always presented a diminished susceptibility to infection. According to Dr. Prigge, the presence of a certain amount of antitoxin in the blood was no proof of an effective immunity to diphtheria, any more than the fall in the antitoxin titre, which might be produced even by non-specific substances, justified any conclusion as to changes in the condition of immunity. The two cases reported by Siegl of diphtheria following inoculation indicated merely that at the time of their attack the patients did not possess any resistance to the diphtheria bacillus or its toxin. No evidence was available to show whether they had possessed any resistance at an earlier date, nor any whether such resistance had been destroyed by inoculation. There was therefore no proof that an increased susceptibility had taken place as the result of antidiphtherial immunisation. And there the matter rests for the moment.

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[1] THE LANCET, May 2nd, p. 985.

[2] Med. Klinik, May 29th, p. 813.

WORKING OF THE SUSSEX PROVIDENT SCHEME.—On May 10th, at the annual meeting, it was stated that during the ten years this scheme had been in operation over £73,000 had been distributed to hospitals and other curative agencies. Through the scheme, £2 4*s.* 6*d.* per week is paid for each in-patient at a coöperating hospital, irrespective of the length of time the patient remains in hospital; 11*d.* for every out-patient; 2*s.* 9*d.* for every X ray treatment, and 7*s.* 3*d.* for every X ray examination. The first year's working of the Queen's Nurses' section of the scheme is held to have been successful, since the number of members who joined the section was 2746, and, including dependants, 6316 people were covered for the free services of the Queen's nurses. The subscription to this section is 2*s.* 6*d.* a year, and the nursing associations in the first year received £311.

SPECIAL ARTICLES

ON THE CAUSATION OF STONE IN INDIA.*

BY ROBERT MCCARRISON, C.I.E., M.D., D.Sc.,
HON. LL.D., F.R.C.P.,

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URINARY calculus is very prevalent in India. During the years 1926–28, 34,325 persons were found to be suffering from the disease—or 1 in 10,000 of the population. These combined records for three years relate only to persons seeking medical relief; as hospital patients form only a small fraction of the population, and as hospitals and dispensaries are sparsely distributed, the disease is more prevalent than the figures indicate.

Distribution of the Disease.

The incidence of stone varies greatly in different parts of the peninsula; it is so prevalent in some localities that they are known as "stone areas," while in others it is rare or unknown. The prevalent belief that India in general is a land of "stone" is erroneous: parts are, others are not. Thus, taking the above figures as our index of its prevalence, we find such variations as the following (in each instance the figures apply to 100,000 of the population): in India generally, 10 in 100,000 of the population; in Dera Ghazi Khan (Punjab), 438; in Hyderabad (Sind), 266; in Sukkur (Sind), 156; in Manipur (Assam), 84; in Dera Ismail Khan (N.W.F.P.), 62; in Saharanpur (U.P.), 25; in Ahmednagar (Lower Bombay), 13; in Benares (U.P.), 5; in Sylhet (Assam), 2·8; in Malabar (Madras), 0·3; in Kolaba (Lower Bombay), 0.

[The lecturer here showed a spot map indicating the distribution of the malady, and pointed out that the great stone area extends from Sind, the North *Western Frontier Provinces, and the Punjab, into* the west of the United Provinces, gradually diminishing eastward towards Bengal and Assam in the south and south-east, the diminution continuing until, in the southern parts of the Bombay Presidency, Mysore, Hyderabad, and Madras, it is relatively rare. The distribution of the disease suggested that there were local factors, geological, geographical, climatic, racial, nutritional or microbic, which exercised an influence on its occurrence. Having given grounds for the view that the physical features of the country were unimportant, he continued :—]

Racial Influences.—It is stated in certain monographs on "stone" that Mahomedans in India are more subject to it than Hindus, and various explanations have been offered to account for this supposed racial difference. But the truth is that no such difference exists. In my series there are 1024 cases in which particulars are given as to the community *of the sufferer; of these* 757, or 73·9 per cent., were in Hindus; 235, or 22·9 per cent., were in Mahomedans; and 32, or 3·1 per cent., were in other communities. Hindus form, approximately, 69·5 per cent. of India's 320 million people; Mahomedans, 21·3 per cent.; and other communities, 9·2 per cent.—percentages which, so far as the two main communities are concerned, are practically identical with the percentage distribution of stone. Mahomedans are, therefore, *no more subject to the malady than Hindus. If* anything, other communities are more afflicted by it than either. The disease appears to be comparatively rare amongst Europeans in India; in my series they formed 0·44 per cent. of the whole.

Nutritional Influences.—In the plains of the Indus and the sub-Himalayan regions fed by the upper reaches of the Ganges most wheat is grown, and the cultivation of maize is considerable; while in Sind the chief crop is millet. As we pass eastward along the Gangetic plain the cultivation of rice increases, reaching its acme in the Delta; southward, also, through lower Bombay to Malabar and Madras, and south-eastward to the deltas of the Godaveri and Kistna rivers, the cultivation of rice increases. In Burma, too, rice is the principal, and often the only, cereal produced. In these places rice is the staple article of diet. The suspicion thus arose in my mind that the gradual decline in the incidence of "stone," from regions where wheat is the principal cereal grown to those where rice is the chief crop might be associated in some way with the cereal forming the staple article of diet of the people.

Experiments on animals showed that this was so. Groups of young albino rats were fed on a diet of the same composition, but in which the cereal, forming 90 per cent. of the diet, differed. It was found that cereal foods ranged themselves in the following descending order of stone-producing potency: whole wheat flour, oatmeal, North Indian millet (bajra), white flour, rice, and South Indian millet (cambu). The result of this experiment provided a partial explanation of the peculiar distribution of "stone"; its great frequency in the wheat-growing areas of the north-west and its relative infrequency in the rice-growing areas of the south and east. But this association is not invariable. Thus stone is as common, even commoner, amongst the rice-eating Manipuris *(Assam) as in the wheat-eaters of Dhera Ismail Khan* (N.W.F.P.). There is more in the occurrence of stone than the cereal which happens to be the staple food in this or that part of India; other dietetic factors are concerned. What these factors are has been revealed, in some part at least, by experiments on animals.

Experimental Production of Stone.

My first experiment was begun early in 1926. It lasted 157 days. The diet consisted of oatmeal (53 parts), linseed meal (20 parts), cornflour (25 parts), calcium phosphate (1 part), sodium chloride (1 part), and distilled water ad libitum. It may be wondered why I used "oatmeal," since it does not enter to any considerable extent into the dietaries of the Indian people. I confess at once that chance determined my use of it. The original object of the experiment was not to produce "stone," but to learn the effect on the thyroid gland of an iodine-poor diet such as this one was. But as things turned out the experiment taught me three things: (1) that this so-called iodine-poor diet did not cause thyroid enlargement; (2) that it did cause stone and its sequelæ; and (3) that it also caused a very grave form of anæmia which subsequent investigation in my laboratory, by Dr. Lucy Wills, showed to be due to *Bartonella muris*, carried by the lice with which my rats were infested. I may draw attention to this last result. Here we of the cervix, and (in Cochin-China) of the buccal mucosa, are abnormally common. An interesting point is that epithelioma is four times as frequent as sarcoma. There can be no doubt that careful observations on the incidence of cancer in native races will disabuse our minds of many false impressions founded only on casual statement or copied from one text-book to another. But the difficulties of controlling diagnosis by biopsy and of arriving at accurate statistics among native patients must be remembered before any general conclusions are drawn from such observations.

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* Being an abstract of the second of two lectures delivered at the Royal College of Surgeons of England, on May 18th and 20th. The first lecture, entitled Some Surgical Aspects of Faulty Nutrition, appeared on May 23rd.

TUBERCULOSIS AT BREST.

ACCORDING to Médecin-en-chef (Surgeon Captain) Cristol[1] of the French Navy, the great problem of to-day in naval hygiene is tuberculosis. In France, Brest is the port specially concerned, Toulon in the south being much less affected. This, Dr. Cristol thinks, is because Provence has always been a highway constantly exposed to infection, whereas Brittany, away in a corner, only began to be opened up and infected 40 years ago. He quotes the surprise of an old Breton practitioner, recently dead, at the "new disease," much in the same way as native chiefs in German East Africa were registering surprise about 1905 at the phthisis brought to their country by Indian immigrants.[2] Forty years ago, but especially from 1900–10, healthy rustics living on farms, their food poor but fresh, with little risk of infection in the count y and so escaping disease began to flock into Brest, lured b where they ofte fresh

have enabled them, as Dr. Cristol has satisfied himself, to live in roomier houses than before. Food too is better since the war; the dockyard canteen feeds, cheaply and well, 1400 men daily. The men drink less and wine is replacing spirits. The growing taste for sports keeps them out of the small dirty cabarets in which they must often have become infected. Dr. Cristol's demographic study, which covers 100 pages of the journal, will no doubt be keenly discussed.

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to vary in their stone-potency, and experiment fixed them in the following descending order: whole wheat flour, millet grown in the north of India, white flour, rice, and millet grown in the south of India. The last did not cause "stone" at all within the 515 days of the experiment. The significance of this in the distribution of stone in India has already been referred to, but another possibility arises. Millet grown in one part of India may be stone-producing, while that grown in another may not: soil, manure, and irrigation conditions—which I had already shown to be capable of causing variations in the nutritive quality of food grains (McCarrison, 1926 and 1928)—may thus be concerned in the production of stone, an aspect of the matter not as yet investigated.

Would additions to the stone-producing diet prevent the malady? One group of rats was now fed on a diet of known stone-producing potency; another on the same diet to which whole milk was added, the milk being given in the proportion of two-thirds of an ounce per rat per day. Stone, and its sequelæ of cystitis, hydronephrosis, and pyonephrosis, were completely prevented by milk containing "something" which counteracted the stone-producing action of the diet. In further experiments butter or cod-liver oil was added; when the butter and the cod-liver oil prevented stone, the vegetable oils in common use in India did not. This narrowed the issue down to deficiency of vitamin A-bearing ingredients as a chief food-fault concerned in stone-production.

[The lecturer here acknowledged the help at this point derived from the work of Osborne and Mendel (1917), and Fujimaki (1926), and described his experiments indicating that the addition of lime to diets deficient, amongst other things, in vitamin A caused a greatly increased incidence of calculus, cystitis, hydronephrosis, and pyonephrosis; while it was

uction and almost universal use of white flour. We have seen also that the distribution of "stone" in India can, to a certain extent, be correlated with the kind of cereals in use in various parts of India; and we have seen, further, that milk and butter, if used in sufficient quantity, afford complete protection against stone in rats. Now the great fault of all Indian dietaries, amongst the poorer classes, who are the chief victims of stone, is that their diets do not contain anything like enough milk and milk products; and I postulate that according to the kind and quality of the cereal grain they use as the staple article of their dietaries, and according to the poverty of these dietaries in milk and the products of milk, so they will be more or less likely to suffer from stone. Milk, and the products of milk, are amongst the greatest of India's needs at the present time. I do not contend that this is the whole story; indeed, I know it is not, but it represents certain chapters of it.

Dietetic Factors Causing Stone.—There appear to be two categories of dietetic factors concerned: (*a*) *positive* factors, including excess of lime in the diet, and some unknown agent present in whole cereal grains; and (*b*) *negative* factors, including deficiency of vitamin A derived from animal sources, and deficiency of phosphates relative to the amount of lime in the diet. I say "vitamin A derived from animal sources" because millions of people in India are dependent for their supply of this factor—whatever that factor implies—on vegetables; I am not yet certain that the latter source of vitamin A is, from the point of view of stone-prevention, as good as the former; I do not think it is, and I notice that de Langen (1929) of the Dutch Indies is of a like opinion.

I must make my position clear in regard to the value of whole wheat flour and oatmeal as articles of diet. Because I have found that whole wheat flour and oatmeal, when they compose the major part of an imbalanced diet, are stone-producing, this is part in the genesis of stone, and in designing its architecture: on occasion, in certain individuals or in certain places, the star part may be taken by one or by the other. In India the "star part" is taken by diet.

The President and the Council of the College have signally honoured me by their invitation to tell something of my research activities in India, and I have been deeply conscious of the responsibility this honour has imposed upon me. I have purposely chosen to refer only to those of my activities which I have thought might be of special interest to surgeons. Even with this limitation much has had to be omitted or passed by with but a few words. But if what I have said may serve to indicate directions in which the newer knowledge of nutrition touches upon the art of surgery—to indicate lines of investigation which hold out the prospect of the solution of certain surgical problems—then I shall have fulfilled, in some small measure, the duty imposed upon me by the invitation to address this great College.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

THE CONGRESS ON INTERNAL MEDICINE.

THE German Congress on Internal Medicine was held in Wiesbaden, Prof. Bergmann, of Berlin, being in the chair. Among the many papers read before the congress, that on angina pectoris was of special interest. Dr. Edens, of Dusseldorf, pointed out that the anatomical condition underlying angina pectoris can be thrombosis or spasm of the coronary vessels, arteritis, or spasm associated with a nervous condition. The sudden obstruction of a coronary artery produces a severe attack and a tendency to these attacks may persist. A spasm of anatomically healthy arteries may lead to an infarct in the heart, and to angina pectoris; an obstruction of a coronary vessel may develop slowly and painlessly. Syphilis of the aorta leads to aortalgia with permanent pain but without oppression and attacks. That angina pectoris can arise from the aorta alone has not yet been demonstrated. Coronary sclerosis alone does not produce angina pectoris without other exciting factors; such factors are abuse of tobacco, over-strain, high tension of the vessels, and adiposity. The prognosis of angina pectoris is better than is generally supposed; it depends on the strength of the heart, ascertained by the electrocardiogram. The treatment must aim at relieving the spasm and combating spasmodic attacks by the administration of sedative and vasodilatory compounds, with due regard to the blood pressure and to the occasional need for the suitable cardiac stimulants. A definitive opinion on the value of modern organic preparations, of X ray treatment, and of operative measures cannot, in Dr. Edens's view, yet be given. Prof. Morawitz, of Leipzig, said that the principal symptom is the pain, of which the cause is not always the same. Conditions predisposing to pain are disorders of the circulation of the coronary vessels, an increased excitability of the vegetative nervous system, and other factors which include over-exertion, cold, psychic influence, nicotine, and overfilling of the stomach. A statistical record of 100 cases of angina pectoris showed that infarct of the myocardium has a mortality of 50 per cent., syphilitic aortitis somewhat better with a mortality of 30 per cent., whilst cases of hypertension are more favourable. The diagnosis of a myocardial infarct is made by clinical observation and the electrocardiogram. Prof. Morawitz showed diagrams to demonstrate the action on the heart of certain compounds such as amyl nitrite and calcium.

SHORTAGE OF CLINICAL AND SCIENTIFIC ASSISTANTS.

Notwithstanding the overcrowding of the medical profession, it has been stated that hospitals, and, still more, scientific medical institutes, have difficulty in finding candidates for appointments as assistants. Those appointments are often advertised in vain, and in consequence foreigners who have studied in Germany, without having acquired a German qualification, have sometimes been appointed, a fact which has led to some protest in medical circles. Prof. Zieler, head of the clinic for skin diseases at the Wurzburg University, states that at his clinic two posts had been vacant long enough to handicap the work of the clinic. He has, therefore, been compelled, for the time being, to give those appointments to foreigners. This remarkable shortage of applicants for posts which used to be popular is attributed to the fact that according to existing regulations medical men desiring to enter into club practice in any district must have resided for several years in that district. Since a period as clinical or laboratory assistant is not counted as residence, young medical men settle as soon as possible in the place where they wish to acquire a club practice.

DELIVERY AFTER CÆSAREAN SECTION.

Dr. Hornung reports in the Centralblatt für Gynäkologie on his experiences of conducting labours in women who have had Cæsarean section performed at a previous delivery. In 57 out of 111 cases the delivery took place in the natural way. To avoid a rupture of the uterine scar, forceps had to be applied in 18 per cent. of the cases. After the birth of the child manual interference often became necessary because of a partial or total fixation of the placenta on the scar; this happened especially in cases where a deep cervical section had been performed. The fixation of the placenta on to the old scar led to profuse hæmorrhage and to a lesion on the uterine wall which might produce severe complications. Owing to the insufficient elasticity of the scar it might be stretched unduly and even ruptured. This complication was observed not only at the end of pregnancy, but also as early as the third month. A rupture of the scar need not be due to a fault in the technique of the suture; it is more likely to be due to repeated pregnancies at short intervals so that the scar has no time to become organised. Repeated Cæsarean section is, in Dr. Hornung's view, even more dangerous and should not be performed without very definite indications.

PYÆMIA AFTER TONSILLITIS.

A paper on pyæmia following tonsillitis was recently communicated to the Berlin Medical Society by Dr. Claus, who described 100 cases. Often a thrombosis of the facial, sometimes of the jugular, vein was present. A characteristic symptom, he said, is pain on pressure at the angle of the jaw, and rigor, not at the onset of the illness but when the local symptoms begin to disappear. Besides the pain in the jaw a deterioration of the general condition, a subicteric and cyanotic colour, a dry tongue, and a frequent and weak pulse are characteristic of this complication. By post-mortem research it has been ascertained that a phlegmon of the retrotonsillar tissue, leading to thrombosis, is the cause. The prognosis is held to be bad, but in Dr. Claus's series about 70 per cent. of the cases were saved by operative measures. The operation consists in laying open the vessels from the clavicle to the tonsils and in ligaturing the facial and the jugular veins.

FUR DYES.

Rabbit furs are often dyed with ursol, commonly termed fur-black, a substance which may be harmful to the workers in and to the wearers of the fur. Dr. Pernice, of the Hospital for Industrial Diseases in Rummelsburg, near Berlin, reports cases where working with the fur for a quarter or half hour only was sufficient to produce in the workmen an acute very painful eczema of several weeks' duration. The cause in these cases is not a fault in the technique of dyeing, but the eczema is a reaction to some product of the dyeing process.

PARIS.

(FROM OUR OWN CORRESPONDENTS.)

THE FOURTH CENTENARY OF THE COLLÈGE DE FRANCE

LAST week there was commemorated in Paris the four hundredth anniversary of the Collège de France, which was originated in 1530 by the institution of royal lecturers. With some changes of name the institution has pursued a continuous, though somewhat chequered, career from that date to this. Imbued with the spirit of the renaissance and of the unfettered and disinterested pursuit of science, letters, and the arts, the College bears on its roll of lecturers through the centuries some of the most illustrious names in the intellectual history of Europe. Alongside the names of Budé, Lascaris, Sainte-Beuve, Champollion, Quinet, Michelet, Rénan and Bergson are to be found those more familiar to students of science and medicine, such as: Ampère, Marey, Regnault, Laennec, Magendie, Flourens, and Claude Bernard. In a historical collection, put together in the "Bibliothèque Nationale," are to be seen portraits, manuscripts, publications, and scientific apparatus associated with the work of the lecturers at the College. The physiological instruments employed by Claude Bernard are exhibited and also a cast taken after death of his distinguished features. The new President of the Republic presided at the great commemoration function which was held in the amphitheatre of the Sorbonne on the afternoon of June 19th. Representatives of 37 nationalities and of more than 300 academies and universities attended at this memorable celebration. Among British institutions represented were the Royal Society by Prof. Armstrong, the British Academy by Lord Chalmers, the University of Oxford by Dr. Allen, the University of Edinburgh by Sir E. A. Sharpey-Schafer, and the University of London by Sir William Collins.

IMMUNISATION AGAINST DIPHTHERIA IN THE FRENCH ARMY.

In a communication to the Academy of Medicine on May 19th, Dr. C. Dopter presented figures showing how serious the ravages of diphtheria have become in the French Army since the war. In 1913, the incidence of this disease among the active forces was only 0·94 per 1000. By 1920, this ratio had risen to 2·28, and in one of the following years it was as high as 8·78. In 1929 it was still as high as 6·39 per 1000. A similar state of affairs has been observed in the armies of other countries. As the usual methods of combating diphtheria, such as ascertainment and isolating of carriers, did not assure an adequate control of the disease in certain highly infected regiments, it was decided early in 1930 to inoculate the Schick-positive recruits with Ramon's anatoxin at the same time that they were inoculated against typhoid and paratyphoid fever with T.A.B. After referring to the experimental work of Ramon and his associates, and showing how it justified the conclusion that immunity to all the diseases concerned can be achieved by a simultaneous poly-vaccination, Dr. Dopter gave a detailed report of his experiences with five regiments. In all of them diphtheria had been endemic for years, taking a heavy toll among the recruits in particular, but not always sparing the older soldiers. The results were strikingly successful. With only two exceptions, the cases of diphtheria breaking out in these regiments after the introduction of this measure were confined to soldiers who had not been inoculated, or whose inoculation had been incomplete. The curious fact that the incidence of diphtheria among the older soldiers not treated with Ramon's anatoxin also showed a marked decline, was interpreted as a consequence of their not being repeatedly exposed to infection by cases of diphtheria in recruits. In other words, being no longer exposed to super-infections, these soldiers were left free to develop a natural immunity. The simultaneous inoculation against typhoid and paratyphoid fever was so effective that no case of typhoid occurred among the troops thus treated, although one of the regiments concerned was stationed in a badly infected district.

AN EXHIBITION OF SANITARY AVIATION.

The authorities of the Colonial Exhibition have authorised the organisation of an exhibition of sanitary aviation between July 25th and 30th. A trophy has been offered for the best system for converting any type of aeroplane or hydroplane into an air ambulance. Lectures will be given on colonial sanitary aviation, and discussions will follow in which foreign as well as French delegates may participate. Demonstrations will be given of ambulance aeroplanes in flight, and visits will be organised to certain factories. This demonstration will coincide with the conferences on colonial medicine to be held between July 22nd and 30th. Those who desire further information can obtain it from the Secretariat of *La Ligue des Amis de l'Aviation Sanitaire*, 52 rue des Martyrs, Paris, 11.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

THE ALLOCATION OF HOSPITAL SWEEPSTAKES.

THE Senate of the Irish Free State gave a second reading last week to the Public Charitable Hospitals (Amendment) Bill, not without considerable criticism. Most of the criticism was against the principle of permitting the rate-supported institutions to benefit from the sweepstakes. There was also criticism of the way in which some of the hospitals which have already benefited largely were proposing to spend their funds, particularly in undertaking further building. Pleas were put in for amalgamation of the smaller hospitals. In particular, Sir Edward Coey Bigger, a former medical administrator of great experience, pointed out that if the sweepstakes of the next three years were as successful as those conducted up to the present, a sum of about £4,000,000 would be available for the hospitals. There were too many general hospitals in Dublin; Cork had three hospitals, and Limerick two. It would be an advantage if these were amalgamated in each city. The plans for the next sweepstake, to be held in connexion with the Manchester November Handicap, are now complete. At least 38 hospitals will share in the benefits, 19 being in Dublin, 6 in Cork, 4 in Limerick, 3 in Waterford, 2 in Drogheda, and 1 each in Galway, Ballyshannon, the Curragh, and Arklow. If the present Bill passes without further amendment some seven other institutions may be permitted to share.

IRISH MEDICAL ASSOCIATION.

The annual meeting of the Irish Medical Association was held in the Royal College of Surgeons, Dublin, on June 17th. Mr. P. E. Hayden, outgoing President, and subsequently, Dr. Eugene Byrne, his successor, took the chair. The annual report stated that the register at the beginning of the year 1930 showed a membership of 388. There were 32 deaths, 29 names were removed for non-payment of subscription, and some resignations. The membership at the end of the year was 303. The council had recently sent out an invitation to medical men who were not members of the Association asking them to join it. Dr. Byrne, of Slane, County Meath, was declared President, and Dr. J. T. Daniel, of Dublin, Vice-President. A committee was appointed to consider the revision of the Articles of Association. Mr. R. R. Leeper, a former honorary secretary of the Association, was elected an honorary member.

MEDICAL BENEVOLENT FUND.

The annual meeting of the Royal Medical Benevolent Fund Society of Ireland was held on June 17th in Dublin, Dr. T. G. Moorhead, President of the Royal College of Physicians of Ireland, in the chair. The annual report stated that 87 grants were made during the year, being one more than in the previous year. The amount disbursed was £2154, as compared with £2104 in the previous year. The beneficiaries included 6 medical men, 15 orphans, and 66 widows. With the issue of this year's support Sir John William Moore completes half a century of service as one of the honorary secretaries of the Fund. During the year Mr. A. B. Clery has succeeded Dr. A. E. Boyd as secretary.

THE SERVICES

INDIAN MEDICAL SERVICE.

THE QUESTION OF CIVIL APPOINTMENTS.

At the final plenary session of the Indian Round Table Conference on Jan. 19th reports of nine subcommittees were received and noted. Subcommittee No. VIII., which was asked to consider the relation of the Services to the new political structure in India, met six times between Jan. 6th and 13th and authorised its chairman, Sir William Jowitt, to present the report which appears in a blue-book (Cmd. 3772. H.M. Stationery Office. 1*s.* 3*d.*). Paragraph 4 of this report deals specially with the Indian Medical Service and paragraph 1 applies to all the Services, including the medical.

§ 1.—*Existing Members of the Services.*—Inasmuch as the Government of India Act and the rules made thereunder by the Secretary of State in Council guarantee certain rights and safeguards to members of the Services, due provision should be made in the new constitution for the maintenance of those rights and safeguards for all persons who have been appointed before the new constitution comes into force.

When the new constitution is drawn up suitable safeguards for the payment of pensions (including family pensions) and provident funds, should be provided.

As it is important that those responsible for the working of the new constitution should not at its initiation be embarrassed by the economic waste and administrative difficulties which a change of staff on a large scale would entail, it is desirable to take such steps as are necessary to reassure existing members of the Services with the view that they may serve with loyalty and efficiency for their normal term.

To this end the subcommittee agreed that the right to retire on proportionate pension should be extended, but opinion was divided as to whether the extension should be for an unlimited term or for a definite period of years, not exceeding five years.

§ 4.—*The Indian Medical Service.*—Subject to paragraph 1, the subcommittee are of opinion that in future there should be no civil branch of the Indian Medical Service; and that no civil appointments either under the Government of India or the Provincial Governments should in future be listed as being reserved for Europeans as such.

The Civil Medical Services should be recruited through the Public Service Commissions. In order to provide a war reserve, a clause should be inserted in the contracts of service of a sufficient number of officers that they shall undergo such military training and render such military service as they may be called upon to do. The extra cost involved should be borne as an Army charge.

Further, the Governments and Public Service Commissions in India should bear in mind the requirements of the Army and the British officials in India and take steps to recruit a fair and adequate number of European doctors to their respective Civil Medical Services, and should be prepared to pay such salaries as would bring about this result.

It is suggested that agreement might be reached between the Central Government and the Provincial Governments whereby the latter in selecting their European doctors might grant a preference to those members of the Indian Medical Service who have performed a period of service with the Army. We contemplate that such members would sever their connexion with the Indian Medical Service during the term of their employment in the Provincial Medical Service—subject only to the acknowledgment of a claim by the Army authorities in time of emergency. The practical details of any such arrangement would have to be a matter of agreement between the Army authorities and each Provincial Government.

(Major Stanley wishes to make it clear that his acceptance of this section is contingent upon the possibility of securing satisfactory agreements under paragraph 4.

Lord Zetland and Sir Edgar Wood fear that under the scheme proposed neither the Provincial Governments nor the Indian Medical Service will secure European Medical Officers of the type required, and they would prefer that the present arrangement should continue until Indianisation both in the Indian Army and in the Civil Services has proceeded further.)

The Conference, in its final resolution, described this report along with those of other committees as provisional but affording material of the highest value for use in the framing of a constitution for India. The Prime Minister, in his speech at the final session, said that the subcommittee dealing with the Services had affirmed the necessity of continuing the guarantees given to existing members and had explored the position as regards the future.

I.M.S. ANNUAL DINNER.

THERE was an exceptionally large attendance at the annual London dinner of the Indian Medical Service held at the Trocadero Restaurant on June 17th. The chair was taken by Colonel R. A. Needham, and there were present as guests: Mr. F. H. Brown (*Times Correspondent for India and the East*); Dr. N. G. Horner (*British Medical Journal*); Dr. Egbert Morland (*The Lancet*); and ten officers now on probation at the R.A.M. College, Millbank.

Proposing the toast of "The Service," Colonel Needham welcomed the presence at the dinner of ten officers on probation, and read a message he had received from the Director-General of the Service in India to the effect that though conditions in India had changed, and would continue to change, new entrants would still find excellent prospects of a career. The I.M.S. flag was still flying, and recruits of the right sort were needed. The faint-hearted should stay at home. Colonel Needham suggested that a reply in the same tone should be sent to the Director-General and their fellow-officers in India. He went on to refer briefly to the various evidence and findings of commissions and committees which had, during the past 20 years, considered the constitution of the medical services in India and possible changes in their organisation. He described the present constitution as a military service with a proportion of officers withdrawn for civil duties to form a war reserve and to provide attendance on Europeans. A constitution of this kind had always been found necessary, and would be just as necessary under a new federal government, whether the name Indian Medical Service was retained or not, should the new Government desire to retain an efficient medical service for the Indian army, and to discharge its essential civil obligations. It was, he thought, too readily assumed that a central service was incompatible with autonomy in the provincial medical services already in being, or with progressive Indianisation. He did not hold that view. The Services Subcommittee of the Round Table Conference had reported that in future, in their opinion, there should be no civil branch of the I.M.S. This opinion implied a complete reversal of policy. Abolition of the civil branch would leave the I.M.S. as an Indian army medical service, to which few, if any, European recruits would be attracted. The Army authorities had not been consulted. They were vitally concerned in a policy which might affect recruitment of British officers for the combatant branches of the Indian army. Perhaps, said Colonel Needham, the wide implications of this innovation had not been fully stated or appreciated in the political atmosphere of the Round Table Conference. The Simon Commission was well aware that a failure of recruitment for the I.M.S. would be disastrous for India, and that a medical service recruited provincially would be no substitute for one with the standards and traditions of the Indian Medical Service. Lieut.-Colonel J. K. S. Fleming proposed "The Chairman" in a few well-chosen words, and Colonel J. J. Pratt made it clear how much was due to the hon. secretaries, Colonel T. A. Granger and Sir T. Carey Evans, for the organisation of a successful evening.

The following is a list of the officers present at the dinner:—

Major-Generals: Sir Havelock Charles, Bart., G.C.V.O., K.C.S.I.; A. A. Gibbs, K.H.P.; J. D. Graham, C.B., C.I.E., K.H.S.; Sir Courtenay Manifold, K.C.B., C.M.G.; Sir Leonard Rogers, C.I.E., F.R.S.; G. Tate, C.I.E.

Colonels: H. Ainsworth; R. F. Baird; J. Fuller-Good, V.H.S.; C. M. Goodbody, C.I.E., D.S.O.; T. A. Granger, C.M.G.; J. A. Hamilton, C.M.G.; J. Husband; I. Davenport Jones; W. H. Leonard, K.H.P.; R. A. Needham, C.I.E., D.S.O.; J. J. Pratt; A. Spitteler, O.B.E.; F. Wall, C.M.G.; C. N. C. Wimberley, C.M.G.

Lieut.-Colonels: A. W. Alcock, C.I.E., F.R.S.; G. P. Alpin, O.B.E.; J. Anderson, C.I.E.; F. A. Barker, O.B.E.; G. T. Birdwood; H. H. Broome, C.I.E.; S. H. Burnett; J. T. Calvert, C.I.E.; H. P. Cook, D. G. Crawford; J. M. Crawford, O.B.E.; H. J. M. Cursetjee, D.S.O.; E. E. Doyle, C.I.E., D.S.O.; H. R. Dutton, C.I.E.; S. Colin Evans; J. K. S. Fleming, C.B.E.; B. Gale; C. A. Gill; A. E. Grisewood; D. Heron, C.I.E.; E. V. Hugo, C.M.G.; M. L. C. Irvine; S. P. James; H. C. Keates; L. H. Khan; H. H. King; R. Knowles; J. C. G. Kunhardt; W. B. Lane, C.I.E., C.B.E.; E. C. G. Maddock, C.I.E.; W. A. Mearns; F. O. N. Mell, C.I.E.; G. McMillar, O.B.E.; A. Miller; T. R. Mulroney; F. O'Kinealy, C.I.E., C.V.O.; A. H. Proctor, D.S.O.; Norman R. J. Rainier; A. J. H. Russell, O.B.E.; G. M. C. Smith, C.M.G.; R. Steen, J. Stephenson, C.I.E.; T. G. N. Stokes; Ashton Street; W. A. Sykes, D.S.O.; C. Thomson; Sloane G. Thomson; R. S. Townsend, M.C.; E. L. Ward, C.B.E.; D. P. Warliker; W. L. Watson, O.B.E.; W. E. R. Williams, O.B.E.; N. M. Wilson, O.B.E.; H. R. Woolbert; H. G. L. Wortabet.

Majors: F. J. Anderson, M.C.; A. C. L. Bilderbeck; Norman Briggs; H. C. Brown, C.I.E.; Sir T. Carey Evans, M.C.; E. S. Goss, M.C.; J. H. Hislop, M.C.; R. N. Kapadia, M.C.; A. C. Macrae; J. J. Rooney; H. M. Ullah Salamat, M.C.; W. J. Webster, M.C.; R. L. Vance.

Captains: J. L. Donnelly; T. A. Doran; G. M. Irvine; M. Taylor; S. C. H. Worseldine.

Officers on Probation: Lieut. M. Kirk Bryce; Lieut. G. K. Graham; Lieut. J. Guthrie; Lieut. H. B. Macevoy; Lieut. M. M. Mansfield; Lieut. J. L. O'Neill; Lieut. M. H. Shah; Lieut. W. J. Stewart; Lieut. B. Temple-Raston; Lieut. A. W. West.

APPOINTMENTS.

INDIAN MEDICAL SERVICE.

Lt.-Col. F. E. Wilson to be Col.

Lt. J. S. McMillan to be Capt. (prov.).

Lt. (T.C.) A. N. Malhotra to be Capt. (T.C.).

Lt.-Col. J. R. J. Tyrrell retires.

Capt. E. P. Carroll relinquishes his probationary appt.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt. H. W. Strong to be Surg. Lt.-Comdr.

H. E. B. Curjel to be Surg. Lt.

ROYAL NAVAL VOLUNTEER RESERVE.

The following appointments are notified: Surg. Lt.-Comdr. H. E. Hall to *Iron Duke*. Proby. Surg. Sub.-Lt. H. R. Vickers to *Victory* for Haslar Hospital.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. A. A. Meaden, having attained the age for compulsory retirement, is placed on retd. pay.

Maj. (temp. Lt.-Col) A. C. Elliott to be Lt.-Col.

Maj. W. B. Purdon to be temp. Lt.-Col.

Lt. D. C. McC. Ettles to be Capt.

J. M. Gibbon to be Lt. (on prob.), and is secd. under the provisions of Art. 213, Royal Warrant for Pay and Promotion, 1931.

ARMY DENTAL CORPS.

Lt. S. D. Badman to be Capt.

ARMY RESERVE OF OFFICERS.

Lt.-Col. T. F. Ritchie, having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

TERRITORIAL ARMY.

Capt. W. E. A. Buchanan to be Maj.

Capt. C. A. D. Mitchell (late T.A. Res. of Off., 4th Bn. Devon R.) to be Lt. and relinquishes the rank of Capt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

2nd Lt. G. D. Kersley, from Gen. List, T.A., to be Lt.

ROYAL AIR FORCE.

E. A. Gudgeon is granted a short service commission as a Flying Officer for three years on the Active List.

THE MISSION TO LEPERS: ANNUAL REPORT.—The annual report states that of the 6350 inmates who have been under treatment at 47 stations in India, China, Korea, Siam, and Africa, 4370, or over 68 per cent., have more or less improved, while 442 have become symptom-free, of whom 310 have been able to return to normal life in the healthy communities. In addition, more than 2600 lepers had been treated as out-patients of the different centres; of these over 61 per cent. improved and 19 became symptom-free. The principal drug used in the treatment is still a derivative of hydnocarpus, or chaulmoogra, oil. A very considerable amount of medical work is being done at over 100 centres in 20 different countries, and in the missions' own homes and hospitals there are about 8200 leper inmates and over 800 healthy children. The report adds that recent investigations in India, Africa, and other parts of the world have discovered vast numbers of lepers as yet unrelieved, and that there is a constant demand for extension of the mission's efforts.

CORRESPONDENCE

INSULIN AND PRESERVATIVE.

To the Editor of THE LANCET.

SIR,—Dr. O. Leyton, Dr. E. P. Poulton, and Dr. Izod Bennett have drawn attention in your columns to the desirability of making the inclusion of antiseptic in insulin optional and not compulsory as is contemplated in the draft regulations of the Therapeutic Substances Act. We would like to produce the following evidence in support of this.

In the first place, the acidity of the insulin is sufficient to prevent the growth of pathogenic organisms as shown by the following observations. Two brands of insulin were tested for their antiseptic properties. Brand B was an insulin of bovine origin containing 0·3 per cent. tricresol. Brand L was an insulin made from pigs' pancreas without any preservative added. The pH of the latter was approximately 4·0. The organisms chosen for testing were hæmolytic streptococci, *B. coli*, *Staphylococcus aureus*, and a mould (*Penicillium glaucum*). Neither the streptococci nor the mould grew in any of the experiments in either of the insulins used and are therefore not included in the table.

In the earlier experiments measured amounts of broth cultures were added to the insulins. This caused a turbidity, and was sufficiently alkaline to raise the pH considerably and diminish the antiseptic qualities of the insulin. In the last experiments (see further) three colonies from a plate were emulsified in 5 c.cm. of the insulin, and two standard loopsful transferred to another 5 c.cm. of insulin, and one loopful of this emulsion was plated on to agar. This procedure was carried out with each organism in each insulin.

—	Control = immediate *plating.*	AFTER 48 HOURS AT— 37° C.	Room temperature.
	Colonies.		
B. coli.			
Insulin B (bovine + 3 per cent. tricresol)	25	0	2
Insulin L (pigs: no preservative)	2320	0	38
Saline	2416	123	3304
Staph. aureus.			
Insulin B	62	0	0
Insulin L	1520	0	0
Saline	1082	2	539

It will be seen that the tricresol in B was sufficient to prevent almost completely the growth of *B. coli* immediately, and also after 48 hours at 37° C. or room temperature. Insulin L, without tricresol, showed that the number of organisms inoculated was high (2320), and yet after 48 hours at 37° C. there was no growth. Left at room temperature there were still 38 colonies after 48 hours. In this case the saline controls showed an *increase* of nearly 1000 organisms at room temperature.

Even more marked was the result obtained with the *Staphylococcus aureus*. Here the insulin L gave no growth either after 48 hours at 37° C. or room temperature, although the original inoculation grew 1520 colonies. We would lay most stress on the room temperature experiments, as these more nearly simulate the conditions of any accidental inoculation.

In the second place the following observations support the suggestion that injection of tricresol is capable of causing a certain amount of irritation.

Intradermal injections of 0·2 c.cm. of insulin B and of insulin L were made into A. S. and W. P. There was an equal immediate painful reaction due to the acidity. In the case of A. S. insulin B left a small nodule which took three to four days to disappear, while insulin L left no lump. As the purity of the two insulins is at least equal, the difference was probably due to the antiseptic. In the case of W. P. an intense reaction of 2–3 in. diameter and lasting seven to eight days was caused by insulin B. Insulin L caused only a transient response, as in A. S. It was evident that W. P. was sensitive to insulin of bovine origin irrespective of the antiseptic, so 0·2 c.cm. of a 0·3 per cent. tricresol solution in saline was injected intradermally. A slight immediate reaction resulted, and a small nodule palpable for over a week, similar to that occurring in A. S., was produced. It is thus evident that tricresol is capable of producing a definite tissue response.

Finally, from the clinical aspect we have used insulin containing *no tricresol* for 13 months and have had less tissue response, a factor of importance in children in whom the area available for injection is less, and who usually have a marked prejudice against using fresh sites for injections. In the *only* case of local infection occurring after injection of insulin not containing an antiseptic the insulin and syringe the patient was using were both found to be sterile; also this patient had previously had an infection while using insulin containing an antiseptic.

To sum up: we find no evidence that absence of preservative is dangerous and definite evidence that the presence of preservatives may be harmful.

We are, Sir, yours faithfully,

W. W. PAYNE.
A. G. SIGNY.

Hospital for Sick Children, Great Ormond-street, W.C.,
June 20th, 1931.

To the Editor of THE LANCET.

SIR,—The views expressed by Dr. O. Leyton, Dr. E. P. Poulton,[1] and Dr. T. Izod Bennett[2] about the addition of antiseptics to insulin are shared by many Hungarian scientists. I should myself regard the compulsory addition as injurious. There may be reason for the addition of an antiseptic to a single hypodermic injection when there is some risk of infection from outside, but this should certainly not be done in the case of a preparation given it may be several times daily over a long period. However small the dose, the antiseptic is then cumulative and no longer indifferent to the organism. In fact, if it has to be given frequently, the dose must be so small as to be ineffective. If the rules of antisepsis are neglected the risk of infection from outside is present in a single injection; careful technique will avoid the risk in repeated injections.

We do not possess an antiseptic which is active and yet does no harm to the organism when frequently injected. The question now raised in connexion with insulin was discussed all over the world in connexion with vaccine therapy when that was new. But vaccines are not as a rule injected daily into the body. We cannot overlook the fact that insulin injections do sometimes give rise to secondary effects, due to what component we know not. The Danish insulin "Leo" was one of the first reliable brands and no such secondary effects have been reported from its use, although they have followed the use of some of the new and very trustworthy brands to which antiseptics have been added. R. Priesel and R. Wagner, assistants in Pirquet's clinic in Vienna, suggested[3] the tricresol content of insulin as the cause of lipodystrophy, after excluding all other possibilities. As a bacteriologist who has had opportunity of controlling theory on a large material at the Institute for

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[1] THE LANCET, May 2nd, p. 996.
[2] Ibid., May 9th, p. 1053.
[3] Zeitschrift für Kinderheilkunde, Nov., 1925.

Social Assurance in Budapest, I am satisfied that any quantities of phenol or tricresol which can produce an antiseptic effect are definitely injurious to the organism, locally and generally. This I have noticed in vaccine as well as in insulin therapy. Antiseptics other than phenol and tricresol hardly count. I am therefore an advocate of insulin without antiseptics, and I have never observed any harm from its use. It seems to me wrong to enforce the addition of an antiseptic; the physician should be at liberty to carry out his principles.

I am, Sir, yours faithfully,

DR. FORBATH SANDOR,
Chief Physician, Editor of "Magyar Orvos."

Budapest, June 15th, 1931.

*** Among the Draft Rules and Orders (dated June 2nd, 1931) proposed to be made by the Joint Committee constituted by Section 4 (1) of the Therapeutic Substances Act, 1925, is the following provision: Part III., Section 9 (2). When any therapeutic substance is issued in liquid form in containers which are sealed in such a manner that portions of the contents can be withdrawn for use on different occasions, the liquid shall contain a sufficient proportion of some antiseptic to prevent the growth of any organism which may be accidentally introduced in the process of removing a portion of the contents of the container.—ED. L.

A MATERNITY SERVICE.

To the Editor of THE LANCET.

SIR,—I write to support the plea of Prof. Blair Bell in his second Ingleby lecture (THE LANCET June 13th) that no new maternity hospitals should be built, as is now being done in many municipal areas. These hospitals are being erected by municipal authorities. It is, so far as I know, the intention of those authorities that they shall be staffed by their own medical officers. I believe, and I know that my opinion is shared by other teachers, that such arrangements will help to perpetuate, rather than diminish, the present maternal mortality- and morbidity-rates. Such medical officers are unlikely to have either the training or the experience necessary to deal adequately with obstetrical problems and difficulties. Far better that, in university cities at least, the money were spent in extending where necessary the already existing maternity departments at the teaching hospitals, where really trained and experienced people are available. Such training is not a matter of six months' residence in a maternity hospital, or of a short post-graduate course in obstetrics.

Further, unless these hospitals are to be used for teaching medical students, their multiplication will tend to diminish the already too small numbers of cases available at teaching schools. If they are to be available for teaching, who is to teach there? No medical school, already so careful in making appointments to its staff, is likely to send its students to be taught by any Tom, Dick, or Harry at a municipal hospital. If the teaching is to be done by the already existing staffs of medical schools then they obviously must have control over methods and technique, for the student, like other people, learns more from example than from precept. In other words, if the new municipal hospitals are to be used for teaching students they must be staffed by the medical school, or at least the medical school must have a predominating voice in the appointments. Will the municipalities allow this? Even if they do, what of the waste of time in going from one institution to another, and of the money needlessly spent in duplicating equipment? Bad as the policy is which sanctions the erection of new maternity departments at municipal *general* hospitals, it is much worse when it encourages the erection of maternity units entirely separated from a general hospital. Every obstetrician knows how essential is constant coöperation between him and his colleagues in the medical, surgical, and other special departments in the management of many of his cases. This close coöperation simply cannot be obtained in the isolated maternity hospital.

It seems almost incredible that the Ministry of Health, genuinely concerned about the maternal mortality-rate, and medical education in obstetrics, should sanction policies so utterly reactionary at a time when coöperation, coördination, and centralisation are essential to progress. It will soon be too late to call a halt.

Since writing the above, I have seen your admirable leading article on the same subject. It puts most ably the argument for "pooling of available resources, intellectual, material, and financial." It is to be hoped that the warning will not go unheeded.

I am, Sir, yours faithfully,

F. J. BROWNE.

University College Hospital, W.C., June 20th, 1931.

MORTALITY AFTER PROSTATE OPERATIONS.

To the Editor of THE LANCET.

SIR,—No urologist in London can have read the article by Dr. R. J. Minnitt in your issue of June 13th (p. 1292) without interest or emotion. His reference to the mode of anæsthesia is valuable, if for nothing else than for bringing up once again the important subject of the optimum method in prostatic surgery. For the rest, one must regard it as bristling with provocations.

The first point that must strike the reader is that ether is made the scapegoat for the post-operative rise of blood-urea. Are there not other factors? It is well known that in the majority of prostatics with a degree of renal deficiency the mere opening of the bladder, or perhaps even the passage of a catheter, is sufficient to send up the blood-urea in virtue of a degree of "kidney shock" occasioned thereby, the cause of which is not fully understood. Such rises of blood-urea may occur after operative drainage, though performed under local or spinal anæsthesia. One must presume, therefore, that when Dr. Minnitt increases his series of gas and oxygen administrations for this purpose he will meet with the same phenomenon.

The second point is that too high a value appears to have been placed upon the blood-urea percentage assessment of operative risk. Many of us have come to rely upon the results of a carefully carried out urine-urea percentage according t
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At a discussion on the results of prostatectomy recently held in the Section of Urology, Royal Society of Medicine, a meeting representative of British urology, the average mortality given was under 10 per cent. All surgeons taking part in this discussion held urological appointments at the larger hospitals, chiefly in London. The figures given were, in the great majority, gathered from hospital practice. I am not in a position to say exactly how many of these surgeons allow some ether administration; I feel I might venture to suggest that 90 per cent. would not be an exaggeration. For my part, having tried most of the known methods of anæsthesia in prostatic surgery, I have come to regard ether inhalation as the safest means of producing unconsciousness, relying upon nerve block (with ½ per cent. novocain introduced into the depth of the rectus sheath) to procure relaxation of the rectus abdominis, the only muscular obstacle in the technique of suprapubic prostatectomy. I have used this method in upwards of 300 cases and have had no case of uræmia in the absence of such complications as hæmorrhage, sepsis, and myocardial deficiency.

I do not feel that an apology is needed for digressing from the primary subject, anæsthesia, to the subordinate one which must appeal acutely to the surgeon performing prostatectomies almost daily, the mortality figure. The chief cause of a high mortality in prostatic surgery is still to be laid at the door of the patient or of his medical adviser, —namely, procrastination. Were patients to seek skilled advice as soon as symptoms arise and to take it, as they have learnt to do in appendicitis or cancer, their earlier presentation for operation would serve their best interests and I venture to think would help the prostatectomist to realise his ambition to keep under the 5 per cent. figure. The publication of such unfortunate results must give rise to an acute wave of unjustifiable pessimism, frightening off those subjects who thus lose the opportunity of being restored to a life of joyous activity, allowing themselves to drift into a state where their existence cannot be worth enduring. One is reminded of the feelings of the sufferers from the stone in the old days, as referred to by Cheselden quoting the words of Rosset the anatomist, who, in 1590, endeavoured to stimulate surgeons to abandon the perineal for the suprapubic route "pitying . . . the perpetual anxieties of those persons who ought to be cut, but were deterred from trying the operation, as the fox was from visiting the lion, by seeing the tracks of abundance of feet towards the Lythotomists, but a few back again."

I am, Sir, yours faithfully,

Portland-place, W., June 20th, 1931. JOHN EVERIDGE.

To the Editor of THE LANCET.

SIR,—In your issue of June 13th Dr. R. J. Minnitt gives a report on the unfavourable effect of ether anæsthesia on the blood-urea. Further investigation on this would be of interest with a view to general surgery as well as prostatectomy, but my immediate concern is with the death-rate of 50 per cent. that he quotes for this operation. This rate is very high in comparison with the results obtained in the hands of some genito-urinary surgeons, and it would be unfortunate if the quotation of a high death-rate should prevent patients from undergoing one of the most beneficent and successful operations in the practice of surgery.

In May, 1915, I published a report in THE LANCET on spinal anæsthesia for prostatectomy, and in 1921 a further report in your paper on a modified method I had been using for some years—namely, a very small quantity of the spinal drug with a very light general anæsthesia. In this report I gave the death-rate as under 5 per cent. Since then, owing to the kindness of Mr. Sydney MacDonald, I have been able to add largely to the number of my anæsthesias, and can now report 402 operations for prostatectomy done under spinal anæsthesia. Of these 402 cases, 382 were cured of their trouble, and 20 died. This is a death-rate of just under 5 per cent.

I have notes of all these cases, and have followed the subsequent result. They are consecutive cases. I should like to give the causes of death in five cases met with in this series, as they are so accidental that they lower the risk of the operation for the individual patient.

1. Patient did well for two days. Then some distension, followed by acute obstruction. Mr. MacDonald diagnosed acute intestinal obstruction, not ileus. A general surgeon did a cæcostomy. At the autopsy an old inflammatory band constricting the splenic flexure was found.
2. Death from cerebral hæmorrhage occurring more than a month after the operation, the patient being very well at the time it occurred.

3 and 4. Pulmonary embolism.

5. Patient over 80. In very good condition when back in bed. Was given gr. ¼ of morphia hypodermically. Became gradually comatose and died of morphia poisoning. He had had no narcotic previously, and was evidently a case of idiosyncrasy.

I am, Sir, yours faithfully,

H. M. PAGE.
Consulting Anæsthetist, West London Hospital.

June 22nd, 1931.

THE VITAMIN B_1 CONTENT OF LIVER EXTRACT.

To the Editor of THE LANCET.

SIR,—It appears to be generally accepted that all commercial liver extracts are deficient in the antineuritic factor (B_1) of the vitamin B complex although they are rich in vitamin B_2. In a recent article[1] Dr. Lucy Wills quotes cases in which pernicious anæmia of pregnancy and tropical anæmia have been cured alike by liver extract and by a yeast extract (marmite). The question arises as to what these extracts have in common. At first glance this would appear to be the B-vitamins, but Dr. Wills quotes a verbal communication from Dr. Harriette Chick to the effect that to produce a vitamin B_1 effect in the rat at least ten times as much liver extract are needed as to produce a vitamin B_2 effect, and concludes that liver extract cannot therefore be called a rich source of vitamin B_1. Certain experiments carried out in this institute during the past six months bear on this question, for they make it clear that the vitamin B_1 content of liver extracts varies to an extent which renders any generalisation in this connexion inadvisable. The results obtained indicate that proprietary liver extracts are divisible into two sharply defined groups, those which contain considerable quantities of the antineuritic factor B_1, and those in which B_1 is present in negligible amount. There is no intermediate class, if equivalents of fresh liver are compared, and the first category includes the majority of the extracts tested.

Eight different liver extracts, as used for the treatment of pernicious anæmia, were tested for their ability to promote normal growth in rats on a diet deficient in all water-soluble vitamins; of these eight extracts, six were found to be efficient sources of vitamin B_1 as well as B_2. Three stomach preparations were also examined for their vitamin content, and all were found to be effectual in correcting a deficiency in both factors of the complex; presumably the stomach preparations, therefore, contain both B_1 and B_2.

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[1] Brit. Med. Jour., June 20th, p. 1059.

The full experimental data will be published in due course. The results suggest that those liver extracts which are rich in B_1 as well as in B_2 should be included in the list of medicaments available for use in cases in which administration of the vitamin B complex is indicated. Clinical evidence can indeed be adduced that such extracts are of practical value as general tonics, a fact which may be partly attributable to their vitamin content.

I am, Sir, yours faithfully,

ESMÉ GILROY.

Institute of Animal Genetics, Edinburgh, June 22nd, 1931.

VENTILATION OF THE HOUSE OF COMMONS.

To the Editor of THE LANCET.

SIR,—I can add a few words to the position as set out in your leading article (p. 1355). The ventilation of the debating chamber can be easily improved by bringing the air in at the front of the gallery and by stopping up the inlets in the floor where the Members sit, leaving open the inlets in the floor of the central gangway. This was the plan suggested by me in 1913 and confirmed by the National Physical Laboratory after the war. The cost would be about £4000 and there is no hope held out by Mr. Lansbury of this sum being available. Complaints are also made of the ventilation in the division lobbies, library, committee rooms, &c. I suggested that without any expenditure of money the conditions in the House of Commons might generally be improved in the winter months by increasing the heating of the air during the hours when the Members are not there, so as to warm up the structure, and by sending in cool air in comfortable volume when the Members are present. The warmer walls and cooler air would then give them better conditions. In the chamber the floor inlets under the benches can be closed by matting. The trial of this plan next winter will, I hope, lessen complaints. I am, Sir, yours faithfully,

LEONARD HILL.

Chalfont St. Peter, Bucks, June 20th, 1931.

THE BOX RESPIRATOR.

To the Editor of THE LANCET.

SIR,—Your annotation last week on Lord Trent of Nottingham contains a statement which I feel should be corrected. It is that "Sir Jesse (Boot) himself in collaboration with Colonel E. F. Harrison devised the box respirator for which the firm supplied all the chemicals required." As one of the officers in the anti-gas department I happen to be in possession of the actual facts, which are these. The design of the first box respirator used by the British army was worked out almost entirely by Colonel Harrison and Captain J. A. Sadd. It became known as "Harrison's tower" and was based on a principle first described by Mr. B. Lambert of Oxford. It is true that Sir Jesse Boot placed his organisation at the disposal of Colonel Harrison and that the manufacture of the respirator was at first entirely carried out at Nottingham. I feel sure that had Lord Trent been alive he would have been the first to deny that he had any part in the design of the box respirator. I am not desirous of minimising in any way the great help which Messrs. Boots' organisation gave in manufacturing the respirator—it was extremely valuable—but in justice to the late Colonel Harrison and others of my former colleagues in the anti-gas department, I think that your statement should not go uncorrected.

I am, Sir, yours faithfully,

H. S. RAPER.

The University, Manchester, June 22nd, 1931.

THE PRICE OF RUBBER APPLIANCES.

To the Editor of THE LANCET.

SIR,—The price of rubber at present is about 3*d.* a pound; 1s. 6*d.* each is charged for rubber finger stalls. It would require about 50 of these to weigh a pound. They are a standard article, capable of being turned out on mass production lines, so that the manufacturing costs must be slight. This discrepancy between the price of the raw product and that of the finished goods surely calls for some explanation. If it were a purely economic question the matter might be allowed, without protest, to solve itself; but if the wearing of rubber appliances prevents infection spreading from attendant to patient and vice-versa, and if their expense acts as a barrier to general use it takes on a public health aspect. It is a far cry from the planting of tiny seedlings of the rubber tree in the East Indies half a century ago to the reduction of maternal mortality, and yet, if the full advantage of the abundance of the raw material created by British enterprise were allowed to be reaped in a reasonably priced manufactured article, the credit which is its due as a factor in the diminution of the death-rate would be assigned to the plantation industry.—I am, Sir, yours faithfully,

Belfast, June 23rd, 1931. R. M. FRASER, M.D.

STAFFORDSHIRE GENERAL INFIRMARY.—The Earl of Harrowby, lord-lieutenant of the county, recently opened new out-patient and casualty departments at this Stafford hospital which have cost £6000.

ROYAL MEDICAL BENEVOLENT FUND.—During the first six months of this year the Committee has been called upon to vote grants amounting to £6349, which is £1161 in excess of the amount voted in grants during the corresponding period of last year. Unfortunately the income received from subscriptions and donations this year does not show a corresponding increase over last year, but a decrease; unless new subscribers will come forward in support of the Fund before the end of this year, the Committee will be forced to curtail its activities.

At the last meeting of the Committee 26 grants were voted, amounting to £562. The following are particulars of two of the cases helped:—

Widow, aged 68, of M.R.C.S. & L.R.C.P. Her husband was professor of Clinical Surgery in a medical school in the Near East. It was brought to the notice of the Fund that this lady, who had enjoyed a good social position with all the ordinary comforts of life, and had lived for many years in a warm climate, had during last winter been living in a bed-sitting room and had often been unable to afford a fire in her room. Owing to unfortunate investments her income had gradually diminished until last year she had only £89 to live on. She had to pay 9*s.* a week for her room, which left only £66 a year for her maintenance, clothes, light, and warmth. Fund voted £36.

Widow, aged 51, of M.B. Husband died in August, 1930, abroad, at the age of 47, having been in private practice abroad for 12 years. The Ex-Service League paid the widow's passage money to England, where she landed at the end of May this year. When debts and outstanding expenses have been paid, it is expected that the husband's estate will yield to the widow an income of £70. Since the death of her husband the widow has had a severe illness, from which she is now only just recovering. When she landed in England she had only the clothes which she had travelled back in. The Fund voted £26 payable during the next six months, as it is hoped as soon as the widow has recovered her health she will be able to undertake some employment. The Guild have supplied clothes.

Subscriptions should be sent to the Hon. Treasurer, Royal Medical Benevolent Fund, 11, Chandos-street, Cavendish-square, London, W. 1.

OBITUARY

JOHN CARSWELL, F.R.F.P.S. Glasg., L.R.C.P. Edin.

Dr. John Carswell, J.P., who died on June 20th at the age of 75, was a pioneer among those who, in the latter part of last century, insisted on the abolition of coercive methods in the management of the insane. His interest in the subject began when, shortly after qualifying from the Anderson College, Glasgow, in 1877, he became assistant to Dr. James Rutherford, at that time medical superintendent of Woodilee Asylum. Rutherford was inspired by ideals which, though they influenced Scottish procedure, could not be effectively pursued in this country until recently when the law has been amended to allow mental hospitals to admit voluntary patients. Dr. Carswell actually put these ideals into practice. He described in his Maudsley lecture in 1924 how he had persuaded the parish of Glasgow, with a population of 600,000, to place the certification of alleged insane persons in charge of one medical officer, and to make provision for the treatment of suitable cases, without certification, in observation wards. It was necessary to convince not only the authorities but the public that numbers of patients could thus be treated successfully who would otherwise have had to be certified, and also that the departure from conventional methods of dealing with the mentally deranged would not menace the community as a whole. Dr. Carswell was able to make his influence widely felt in medical and lay circles, since he held the posts of lecturer on mental diseases to the Anderson College Medical School, certifying officer to the parish of Glasgow, and physician to the mental wards established in the East District Hospital. In 1914 his work was recognised in his appointment as a medical commissioner to the General Board of Control in Scotland, and from that time onwards he took an important part in elucidating medico-legal aspects of lunacy. His Maudsley lecture, referred to above, was on sociological considerations bearing upon the occurrence, prevention, and treatment of mental disorder. He surveyed the opposing points of view—that the betterment of bad social conditions would improve the mental health of the community, and, on the other hand, that better social conditions would lead to the preservation of the unfit and therefore produce more insanity—concluding that the existence of much the same degree of constitutional instability in good and bad districts damaged both arguments. Dr. Carswell's pronouncement on uncontrollable impulse in connexion with responsibility for crime opened a discussion by the Royal Medical Psychological Association on the report of the Atkin Committee which cleared up several issues.[1] His last important public duty was the delivery in 1928 of the Morison lectures before the Royal College of Physicians of Edinburgh. In these lectures, entitled psychology and medicine, he entered a plea for the closer union of psychological and physiological research, believing rather unfashionably that advances in psychological medicine are most likely to come from investigations such as are directed to ascertaining the causation of physical disease. Dr. Carswell's productive work for improved conditions for the insane and for the prevention of insanity by early treatment of mental abnormality will provide a notable chapter in the history of psychiatry and his name will long be remembered.

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[1] See THE LANCET, 1925, ii., 1171.

RONALD CAMPBELL MACFIE, M.B., C.M., LL.D. Aberd.

Dr. R. C. Macfie who died on June 9th at a nursing home in London at the age of 65 years was a man of wide sympathy and high ideals. He had a big circle of friends, the present Prime Minister amongst them. He was first and foremost a poet. His prowess and position in this direction were recognised a couple of years ago by the invitation he received and accepted to deliver a series of lectures on the art of poetry in the land of his birth. He qualified in medicine at Aberdeen in 1897 and received later an honorary degree of his own university largely in recognition of the charm of his poem Granite Dust, written in commemoration of her foundation. His ode War has been hailed as the greatest poem that war had produced and as one of the greatest odes in the language. Besides poetry he wrote extensively in prose both as an author of such books as The Romance of the Body, and Heredity, Evolution and Vitalism, and as a journalist.

DR. MACFIE.

[Photograph by E. O. Hoppé.

Macfie's poetic temperament, intolerance of anything having even the semblance of being sham or mean, his occasional shortness of temper, and his unselfishness often militated against worldly success. These qualities sometimes terminated friendships which would undoubtedly have been more lasting if the recipients of his friendly strictures had been more penetrating, or the strictures less outspoken. His high ideals were unfortunately for him not often mixed with that business shrewdness usually ascribed to a Scot. Many of his numerous projects for bettering mankind while aiding himself to make a living came to nought. At one time he would be about to found a truly useful international open-air school, at another to exploit for the health of invalids the climatic advantages of some resort on the south-west coast of Ireland. But few of such schemes were of a lasting success in spite of his quite extensive medical experience and his true human sympathy for the sick and needy.

As a Conservative pacifist with some strong Radical leanings, with friends in many nations and experience of living in many lands, he had a variety of strange experiences during the war both as a doctor and as a writer. His chief rôle in medicine was as a sanatorium physician. At one time or another nearly all the best-known sanatoriums in the United Kingdom opened before the war had his services as resident officer or as locum tenens. But his heart was always more in writing than in medical practice.

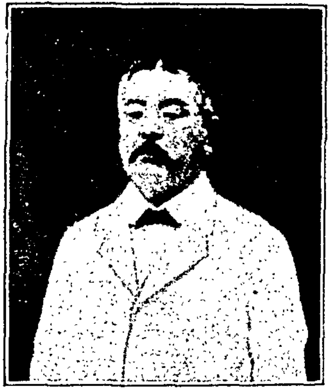
Sir Arthur Thomson writes: "Ronald Campbell Macfie was well known to lovers of poetry and to those interested in the *magnalia naturæ*, but few of us knew him intimately or realised his greatness. From a conventional point of view, which has of course its admitted shrewdness, Macfie was a philosophical physician, who specialised on pulmonary troubles, and wandered from one sanatorium to another, or had occasional compliments as consultant, or enjoyed holidays abroad in one or other of the great caravansaries. He never told us much about this medical experience, but we gathered that it engendered in him a deep sympathy for human frailties, and that it never inhibited his impulse to blurt out the truth. He was always 'daring himself' to be outspokenly sincere. But we must not be thinking of Macfie in any pitying way, as if he did not make a success of his life. He had more red letter days in his hardest and loneliest year than most of us have in our lifetime, for he had a poet's visions and he was ever on the quest after truth—whose pursuit is even more rewarding, Lessing said, than its capture. His was a high-strung, breezy nature, loving much and fighting well, dreaming dreams and helping his fellowmen, very gentle and very fierce, a devotee of beauty and a passionate defender of the faith.

"Ronald Campbell Macfie—his full name seemed to suit him—was an Aberdonian, but far from typical, in being so largely a man of feeling. He graduated in arts as well as in medicine at Aberdeen, and afterwards extended his medical discipline at other schools and in foreign parts. He told us that he had greatly enjoyed some of the locum-tenens posts he had held—at Teneriffe, for instance. He had a high standard of health—an ascetic, with a great respect for his body. Intensely religious, he reacted almost too violently from materialism and from mechanistic analysis of life; and there is a white-hot expression of this in his last published book Science Rediscovers God, or The Theodicy of Science. Many of his poems, such as that on the Quatercentenary of Aberdeen University and his Song of Labour, seem to us pure gold, and he had in his prose, as in The Romance of the Body, many a poetic flash that made a commonplace fact a wonder of the world. He had a grateful love for his alma mater, and it was a great pleasure to him to return after many years to be laureated, and to come back, just the other day, to give the Thomson lectures in the Theological College. He made us all better by his presence."

SHIBASABURO KITASATO, M.D.

A LINK with Robert Koch is broken by the death on June 13th of Prof. Shibasaburo Kitasato, the founder of the bacteriological institute at Tokyo which bears his name. Kitasato was among the fathers of bacteriology. He was the first to obtain pure cultures of the tetanus bacillus, and his classical work, published jointly with Emil v. Behring in 1890, on immunisation against tetanus, provided the basis on which modern serotherapy is founded. In 1894 he discovered the cause of plague. (Yersin)

Kitasato was born in 1856 at Ogunigo, a mountain village in Southern Japan. He received his medical education in the newly established medical school in Kumamoto, under Prof. Mansfeld. Later he studied in the Government Medical School at Tokyo, qualifying in 1883, when he entered the Central Public Health Service. In 1885 he was sent to Germany by the Japanese Government to study bacteriology under Robert Koch. He worked at first on *B. tuberculosis* and then on the tetanus bacillus, isolating it in pure culture, and producing tetanus in animals with his cultures. His great contribution to medicine was his discovery, jointly with Behring, that the cell-free blood serum of animals inoculated with tetanus toxin neutralised the toxin so as to render it inert.



BARON KITASATO.

He continued his work in Germany until he returned to Japan in 1892 to establish a private laboratory for the study of bacteriology, which was the first institute for scientific research in the country. This laboratory was subsequently brought under the control of the Hygiene Society, later subsidised by the Government, and finally, in 1899, the institute, which had been rebuilt, was taken over by the State under the Minister of the Interior, and its work was linked with that of the Government vaccine lymph farm and the serum institute under the general direction of Kitasato. New buildings for this Imperial Institute for Infectious Diseases were erected at Shirokane-daimachi in 1905. During this period Kitasato had not confined his attentions to administrative work, but with his pupils had published several important researches in bacteriology. He himself was ordered abroad periodically to investigate epidemics or to attend congresses; it was on one such mission, during an epidemic of bubonic plague at Hong-Kong in 1894, that he discovered *B. pestis*.

In 1914 the Imperial Institute for Infectious Diseases was transferred suddenly to the control of the Minister of Education, and later was amalgamated with the Tokyo Imperial University. Resenting this change, in regard to which he had not been consulted, Kitasato resigned his directorship, and his pupils followed him to a private institute, known as the Kitasato Institute. He was not long allowed to withdraw from public life, since the Keio-Gijiku University pressed him to organise a new medical faculty. Kitasato accepted the offer, and acted as dean of this faculty, which attained great prestige, for some years, being eventually succeeded by his lifelong associate, Dr. Kitashima.

In 1917 the Emperor of Japan appointed Kitasato a Member of the House of Peers in virtue of his distinguished public service, and thereafter he took some part in medical politics. It was largely owing to his efforts that some ten years ago a medical practitioners' association was organised on a legal basis, all the doctors in Japan being united in the organisation. Kitasato was the first president of this association. In 1924 he was made a baron. Kitasato was honoured by learned societies in many countries, among which was the Royal Society of London, of which he was a foreign Member.

We are indebted to Prof. Mikinosuke, of the Kitasato Institute, for many of the personal details noted above, and also for the following appreciation: "All of us who have associated with him in his life work hoped that Kitasato might yet live long years, and guide us with his master mind to greater progress in medical science and public health. His sudden death has deprived us of one of the most distinguished and influential leaders in scientific as well as social circles in modern Japan. In recollecting the dominant characteristics of this great man, I may mention some of his traits, which have left on us the deepest impressions. Kitasato was a man of filial affection toward his parents and a devoted follower of his teacher. While Koch was in Japan, Kitasato always attended his teacher with the utmost care as though serving his own father. When Koch died, Kitasato built a shrine in the inner court of the institute in remembrance of his great teacher. Each year, on the day of Koch's death, Kitasato commemorated with an appropriate Shinto ceremony the memory of the departed soul. Now, he himself passed beyond the horizon of life, the two great souls may meet in eternity."

PUBLIC HEALTH SERVICES

REPORTS OF SCHOOL MEDICAL OFFICERS.

—	No. on roll.	Average attendance.	Routine inspections.	Special exams. and reinspections.	Percentage of defects.
Hull	47,375	42,628	15,471	58,488	18·6
Birmingham.	—*	—*	42.724	79,895	24·10
Wigan	13,327	12,110	3,508	9,923	20·6

* Not stated.

Hull.

IN a table Dr. J. Morrison shows that the school clinics in the city treated, besides the scholars, 1855 patients, such as infants, nursing and expectant mothers, tuberculous patients, and blind trainees. School-children were given artificial light at a maternity centre, X ray and orthopædic treatment at a combined clinic; scholars with scabies and dirty heads went to a disinfecting station, and swabs from school-children's throats were examined by the city analyst. In addition there is a special liaison with the tuberculosis department. A spectacular result of the efficiency of the medical and nursing staff, and of the value of the X ray installation, is the reduction in cases of ringworm of the scalp from 440 in 1927 to 82 in 1930. Dr. W. M. Frazer, in his introductory note as medical officer of health, says there seems to be no reason why this disease should not virtually disappear in a few years. The city authorities have realised the great need for open-air education, for which nearly 1000 children have been classified as suitable. There are open-air classes and a plan is given of an excellently designed open-air school which was to be ready in April. A nursery school will also be available this year. Attention is being devoted to the hygienic condition of the schools as a whole, the programme of educational reorganisation having emphasised the desirability of altering some of the old schools. The practice of teaching hygiene in the schools has been investigated with the usual result: the teachers' efforts are praised, but the efficiency of the instruction is found to vary much. Hygiene should of course form a definite part of the curriculum in every school. In an appendix is given an account of the X ray treatment which has cured every case of ringworm of the scalp. It is observed that very young children may need only half or even a quarter of the adult dose; the degree of epilation should be such that at the end of 14 days all the hairs are loose. If not, the dose has been insufficient. On leaving the clinic the child is provided with two linen caps and a box of ointment containing salicylic acid grs. xx., precipitated sulphur grs. xx. in soft paraffin 1 oz., and told to keep quiet for 48 hours after the irradiation, since headache and slight sickness may ensue, though they quickly subside.

Birmingham.

In the year under review the city council took over the duties of the guardians of the poor, and Dr. G. A. Auden asks that the work of the school medical service should be looked at very widely. Not only must defects be sought out and remedied; the underlying causes must be determined, else the work fails of its task as part of a preventive service and remains palliative. One child may need to go to hospital, another to a convalescent home, in others the home conditions may require consideration or poverty have to be dealt with. The service becomes the nexus of ameliorative agencies in the city.

One type of agency for remedial work is the school clinic, and the report contains a description and plan of the new clinic at Bordesley Green. Another is the system of cottage homes and the supervision of boarded-out children. These children need care because their parents could not or did not give it; many of them bear marks, physical and psychological, of their earlier life. At the cottage homes they are placed under advantageous conditions, and it is instructive to note how rapid is the physical recovery from the effects of an unhealthy environment compared with the lasting results of psychological maladjustment. At these homes special attention is given to the teeth, a fact that recalls a recently growing type of remedial activity in the schools—namely, orthodontic treatment. It is estimated that at least 5 per cent. of Birmingham children are in serious need of regulative treatment for malformed jaw and misplaced teeth. A note on absentees brings to light another source of benefit to these city children. In acknowledging the information on medical causes for absence from school courteously supplied by busy practitioners, Dr. Auden says it is their reports which have led to the provision of special treatment (ultra-violet, artificial sunlight) and of appropriate schooling (open-air classes). The nexus reaches out again to the three nursery schools whose benefits in poor areas have been so marked that an increase in accommodation is being considered.

An example of an agency not belonging to the city authority is the residential home at Haseley Hall established by the I.C.A.A. It is, however, recognised by the Board of Education as a special school, and close relation is maintained with the school medical service. It is intended to receive children with well-marked rheumatism, whose hearts are unaffected or so slightly involved that there is a prospect of substantial restoration. Since care of the mind is as essential as care of the body, mention should be made of the work at the remand home, where observation and medical report facilitate the task of magistrates in doing their best for delinquent children. Wider still is the scope of the special inquiries which in the long run may be of even greater benefit to the community. Examples are one on the influence of vitamin D on the teeth, and another on the after-results of tonsillectomy.

Wigan.

Dr. H. Whitehead and his assistants are fighting an uphill battle. Though the report describes good progress made with orthopædic and dental schemes, yet the facts and figures show a great deal more to gallant friend a copy of the *report of the* proceedings of a conference of local *governments* which considered the reports of these inquiries. Following upon the *deliberations* of this conference the Government of India have recommended all local *governments to* make an analysis of the figures of consumption in districts where it is known to be high; to obtain more exact information as to the extent to which opium is *given to* children: to experiment with rationing and registration of *consumers; to attempt* to equalise the sale price of opium on *inter-provincial boundaries*; and to consider the possibility of *propaganda* and welfare work in connexion with the administration of opium to children.

Child Labour Convention.

Mr. BROCKWAY asked the Home Secretary what was the attitude of the British Government's representatives at the recent International Labour Conference at Geneva to the resolutions *regarding* the inclusion within the Child Labour Convention of children *now* excluded from protection in various works, the prohibition of overtime and *night work in the case of* young persons under 18, the inclusion of domestic workers within the *convention*, and the prohibition of street trading in the case of girls under 18. Mr. SHORT (Under Secretary to the Home Office) replied: *The Conference only concluded towards the end of last week* and full information is not yet available. If the hon. Member will repeat his *question* later, my right hon. friend will endeavour to give him the information.

Under-nutrition in Mauritius.

Mr. MCSHANE asked the *Under* Secretary for the Colonies if he would have a special medical *report* prepared on the incidence and area of under-nutrition in Mauritius, *and* especially upon the Indian population, particularly since the hurricane of March last.—Dr. SHIELS *replied*: Yes. *I will ask the Governor* to obtain a report on the subject from the Director of the Medical and Health Department of the Colony. I understand that when this question of the existence of under-nutrition was first brought to *notice* an *investigation* was ordered by the Acting *Governor. The report* is not yet to hand, but I am *taking* steps to secure it.

TUESDAY, JUNE 23RD.

Cost of Maintenance in Military Hospitals.

Mr. MIDDLETON asked *the* Secretary for War the total overhead cost of maintenance *per capita per diem* in military hospitals at home during the financial years 1913–14, 1920–21, and 1930–31.—Mr. T. SHAW replied: *I* cannot give figures for the year 1913–14, since *at* that time no cost accounts were kept of military hospitals. In 1920–21 the *estimates show (page 60) that the average* cost per *diem* for each occupied bed was 9*s.* 7·45*d.* For 1930, figures are given on page 72 of Army Estimates showing the gross *cost of* five of the largest military hospitals at home and the number of equipped beds maintained *at* each hospital. For other hospitals at home cost accounts are no longer kept.

Experiments on Living Animals.

Mr. FREEMAN asked the Home Secretary whether he would arrange to publish in *future annual* reports of experiments on living animals and the full *names of all* licensees.—Mr. CLYNES replied: *The names of all* licensees with their degrees and the *registered places* for which their licences are available are published every year in Table II. of the Annual *Return*. It would be impracticable to include reports of experiments in the Annual Return.

Slum Clearance in Scotland.

Mr. McGOVERN asked the Secretary for Scotland the numbers of ordinary, *intermediate*, and slum-clearance houses built in Shettleston *parliamentary* division from June 1st, 1920, to June 1st, 1931, and the number of houses closed *and demolished*.—Mr. ADAMSON replied: The numbers of ordinary, *intermediate*, and slum-clearance houses built by Glasgow Corporation in the Shettleston parliamentary division *from* June 1st, 1920, to June 1st, 1931, are 184, 438, and 612 respectively, and the number of houses closed and demolished during the same *period* is 391.

Miss LEE *asked* the number of condemned houses in Scotland which were at *present* occupied; and what percentage of these would be replaced by slum-clearance houses within six months, a year, two years, and three years respectively.—Mr. WESTWOOD (Under Secretary for Scotland) replied: Complete figures of the number of unfit houses in Scotland *are not* yet available as a number of local authorities have not yet submitted the statement required by Subsection (2) *of* Section 22 of the Housing (Scotland) Act, 1930. According to the statements that have been submitted by 180 *local* authorities, the number of houses *estimated to be* required to replace unfit houses is 37,840, and the *number of houses* likely to be provided by these local authorities within three years *to* replace unfit *houses is 24,321. I am unable to state* what percentage of the unfit houses *will* be replaced by these new houses within the periods mentioned in the question; this will *depend* upon the rate of progress made by the local authorities during *these* periods in carrying out their three years' programme.

Cost of Housing in Scotland.

Mr. MCGOVERN *asked the Secretary* for Scotland the *cost* of three-apartment *and four-apartment* houses which were built in 1923 and 1924 *at* Sandyhills, Glasgow; the cost of the latest houses built on the *same site* during 1930; and the respective rents.—Mr. ADAMSON replied: The costs of the three-apartment and *four-apartment* houses built by the Glasgow Corporation at Sandyhills in 1923 and 1924 were £439 and £553 respectively, while the costs of the houses of the *corresponding types built by the Corporation* on the same site during 1930 were *£335 and £102* respectively. The rents of the houses built in 1923 and 1924 are £27 and £35 per annum for the three-apartment and four-apartment houses *respectively*, and the rents of the houses built in 1930 are £28 and *£35 for the three*-and four-apartment houses respectively.

MEDICAL NEWS

Society of Apothecaries of London.

At recent examinations the following candidates were successful:—

Surgery.—O. A. P. Clark, Westminster Hosp.; A. J. P. Coetzee, London *Hosp.*; *S. D.* Jouhar, Univ. of *Durham*; J. L. F. King, *Charing* Cross Hosp.; R. Pakenham-Walsh; Univ. of Oxford and St. Mary's Hosp.; and T. L. O'C. Ryan, Univ. of Edinburgh.

Medicine.—O. A. P. *Clark*, Westminster Hosp.; A. K. Guha, Univ. of Manchester; S. D. Jouhar, Univ. of Durham; D. M. Nightingale, *King's Coll. Hosp.*; S. H. Thaler, Guy's Hosp.; and C. F. Williamson, Univ. of Birmingham.

Forensic Medicine.—G. R. Germany, Univ. of Sheffield; A. K. Guha, Univ. of Manchester; S. D. Jouhar, Univ. of Durham; D. M. Nightingale, King's Coll. Hosp.; T. L. O'C. Ryan, Univ. *of Edinburgh*; and E. S. St. John, Guy's Hosp.

Midwifery.—A. K. Guha, Univ. of Manchester; O. L. Matthews, Univ. Coll. Hosp.; B. Rivlin, Univ. of Frankfort and Middlesex Hosp.; R. Schauder, King's Coll. Hosp.; E. Teplitzky, Univ. of Berne and St. Mary's Hosp.; and K. G. Wrigley, Univ. of Leeds.

The following candidates, having completed the Final Examination, *are granted the Diploma of the Society* entitling them (upon *registration under the Medical Acts) to practise* medicine, surgery, and midwifery: A. J. P. Coetzee, S. D. Jouhar, D. M. Nightingale, R. Pakenham-Walsh, T. L. O'C. Ryan, and S. H. Thaler.

University of London.

At a meeting of the Senate held on June 17th the Rev. *J. Scott Lidgett* was re-elected Vice-Chancellor for the year 1931–32.—Mr. H. L. Eason, M.S., was appointed a member of the Court for a period of five years.—Dr. Millais Culpin was appointed to a university chair of *medical* industrial psychology, tenable at the School of Hygiene and Tropical Medicine.

Medico-Legal Society.

The annual general meeting of the Society was held at 11, Chandos-street, Cavendish-square, W.1, on June 25th. The *following* officers were elected or re-elected:—President: Lord Riddell. Vice-Presidents: Dr. A. S. Woodwark, Dr. F. J. McCann, and Mr. W. A. Chadwick. Hon. Treasurer: Sir Walter Schröder. Hon. Editors of Transactions: Dr. Gerald *Slot and* Mr. Everard Dickson. Hon. Auditors: Mr. H. B. Wells and Colonel C. T. Samman, M.B. Members of Council: Mr. A. A. Romain, Mr. B. A. Levinson, and Dr. J. S. *Fairbairn*. Hon. Secretaries: Mr. Ernest Goddard and Sir Bernard Spilsbury. At the conclusion of the annual general meeting a paper was read by Dr. T. H. Blench on Crime Investigation in Paris.

Royal Free Hospital Appeal.

The present portion of the Nurses' Home, built on freehold land, is unable to provide sufficient accommodation for the number of nurses required to meet the growing needs of the hospital. The beds in the hospital cannot be increased until *there* is accommodation for a larger nursing staff. The estimated cost to extend and equip this Home is £68,000; of this, £21,000 has been subscribed, leaving £47,000 yet to be found. In order to aid the hospital an appeal for this sum *and for* funds for general maintenance has been issued; Miss Ruth Draper is giving a special matinée at the Vaudeville Theatre on Tuesday, June 30th, at 2.45 P.M., which it is hoped will be largely attended.

University of Liverpool.

Dr. H. Leith Murray, M.D. Aberd., F.C.O.G., has been appointed to the chair of midwifery and gynæcology in succession to Prof. W. Blair Bell.

University of Manchester.

Mr. Stephen Leonard Baker, M.R.C.S., L.R.C.P., D.P.H. Lond., has been appointed Proctor Professor of Pathology and Pathological Anatomy in succession to Prof. J. Shaw Dunn. Since 1922 he has held the post of senior assistant in the Bland-Sutton Institute of Pathology at the Middlesex Hospital, and in 1928 was appointed Reader in Morbid Anatomy and Histology in the University of London. He received his medical education at the London Hospital, where he worked in the pathological department under Prof. H. Turnbull. The Council have appointed Prof. J. S. B. Stopford as Dean of the Medical School in succession to Prof. Raper.

National Conference on Maternity and Child Welfare.

This conference, held under the auspices of the National Association for the Prevention of Infant Mortality, will meet next week at the City Hall, Cardiff. On July 1st debates will be held morning and afternoon on an effective maternity service for the whole population. On July 2nd a debate on the mental health of the normal child in the morning will be followed in the early afternoon by one on the physical health of the child from 1 to 5, while in the late afternoon the best practical means of combining antenatal and postnatal care of the mother, especially in rural areas, will be discussed. On July 3rd the conference will discuss problems connected with children in institutions and boarded-out children.

Glasgow Post-Graduate Medical Association.

The following arrangements have been made for post-graduate teaching in Glasgow during the summer of 1931: (*a*) A general medical and surgical course from August 17th to Sept. 11th. (*b*) Clinical assistantships in general and special hospitals. Further information may be obtained from the Secretary of the Association, The University, Glasgow.

A Coöperative Mental Hospital.

The town councils of East Ham and Southend-on-Sea have agreed, subject to the consent of the Board of Control, to build a joint mental hospital for their respective patients. A site of 500 acres has been found at Runwell, 12 miles from Southend, and 24 from East Ham. The ultimate provision will be 1000 beds, but in the beginning there will be 500 for East Ham and 350 for Southend. At present East Ham has to board out patients as far afield as Gateshead, Taunton, and Worcester.

Royal Hospital for Incurables.

The festival dinner of this institution last week produced a record collection of £16,361, including £3000 from a single donor. There are 109 names on the waiting list, but no beds are vacant, and the annual expenditure of £50,000 is raised with difficulty. The majority of the patients are suffering from rheumatoid arthritis. It was stated at the meeting that "the Board have secured the services of an eminent physician to see what modern science can do to alleviate their suffering."

Fellowship of Medicine and Post-Graduate Medical Association.

The following free demonstrations in out-patient departments will be given: June 29th, at 1.30 P.M., Royal National Orthopædic Hospital, by Mr. Rocyn-Jones; July 3rd, at the Prince of Wales's Hospital, Tottenham, at 2.30 P.M., by Dr. B. H. Jones, and at 3 P.M. by Mr. Dickson Wright, on the Treatment of the Complications of Varicose Veins. A ward round on June 30th, at 2.30 P.M., at the Victoria Hospital for Children, by Dr. R. C. Jewesbury, may also be attended free. For the following lectures and courses fees are payable: A lecture on Recent Advances in Treatment of Disorders of Calcium Metabolism and Calcium Therapy will be given by Dr. Gerald Slot at the Royal Waterloo Hospital on July 1st at 4.30 P.M. A special course in Proctology will be given for one week, June 29th to July 3rd, at St. Mark's Hospital, City-road; it will include operations, demonstrations, and lectures. A special course in Diseases of Children will be given by Dr. John Gibbens at the St. John's Hospital, Lewisham, for two weeks, commencing June 29th, occupying every afternoon. Forthcoming courses include medicine, surgery, and the specialties at the Prince of Wales's Hospital, Tottenham, July 6th to 18th, and a similar course at the Miller General Hospital, Greenwich, July 20th to August 1st. Each course will occupy the whole day from 10.30 A.M. to 5.30 P.M. Syllabuses and tickets can be obtained from the Fellowship of Medicine at 1, Wimpole-street, London, W. 1.

Alexandra Rose Day.

Instead of the £60,000 that had been hoped for, the amount collected in London and Greater London on Alexandra Rose Day, which was marred by bad weather, fell to £50,000. Two years ago £58,000 was collected.

Radium for Nottingham.

With the help of Mr. W. G. Player, Nottingham General Hospital has acquired an additional gramme of radium from the National Fund; hitherto the hospital has possessed three-quarters of a gramme. The hospital now becomes one of the National Radium Centres.

Frenchay Sanatorium, Bristol.

Sir George Newman, chief medical officer of the Ministry of Health, last week opened the completion of Frenchay Park Sanatorium and Orthopædic Hospital for Tuberculous Children belonging to the corporation of Bristol. There is now accommodation for 100 patients.

Royal National Pension Fund for Nurses.

At the annual meeting last week it was reported that 1930 had been a very satisfactory year. The new policies numbered 855, as compared with 721 in 1929, with a new premium income of £19,000. There are now 3847 nurses receiving annuities averaging £30 7*s.*, and the invested funds exceed two millions and a quarter.

Royal Society of Tropical Medicine and Hygiene.

This Society has moved into its new home at Manson House, 26, Portland-place. At present only the office and library are ready for occupation, but the necessary alterations are being carried out as soon as possible, and a small hall for meetings is being erected at the rear of the building. As a result of the appeal issued last year by the President (Dr. G. Carmichael Low) and Sir Austen Chamberlain, a total of nearly £12,000 has been reached, but a further £17,000 is required to equip Manson House as a suitable headquarters for the Society in order that its Fellows visiting England can meet and discuss with those at home the problems of tropical medicine and hygiene. Donations should be sent to the President, at the house of the Society, *26, Portland-place, London*, W.1.

London Light and Electrical Clinic.

The governing body of the clinic, which has recently been reorganised, is the Order of St. John of Jerusalem. On the recommendation of the medical advisory committee honorary consultants have been appointed, by whom all new patients are examined. A staff of specialists in the methods of physical medicine control the treatments, which are carried out under their direction by trained State-registered nurses. Sir Leonard Hill, who is the director of research and teaching at the clinic, will henceforward act as medical supervisor. Payments for treatment are regulated by the means of the patients, and are arranged by the Lady Almoner. To meet the requirements of those able to pay higher fees a private department is available. Some 2500 treatments are given every week at this clinic, which is situated at Ranelagh-road, S.W. 1.

Children's Hospitals.

A meeting was held at St. Pancras town hall recently in connexion with the reconstruction scheme of the Hospital for Sick Children in Great Ormond-street. Mr. J. G. Ketchen, the financial secretary of the hospital, said that the present administration was suffering from the failings of those who had preceded them and had built so that there were wards which excluded the sun and there was no space for a lift, and children who were operated on had to be carried back to their wards. The hospital had no observation beds, and had insufficient accommodation for research work, which had to be done in underground passages. A new nurses' home as well as new hospital buildings was needed.—The Lord Mayor of Liverpool last week opened extensions of the Royal Liverpool Children's Hospital, Heswall, which is now the largest children's hospital in the country with 390 beds—240 at Heswall, 124 at Myrtle-street, Liverpool, and 26 at Thingwall. The extensions have been made possible by a gift of £15,000 from Mr. Andrew Gibson. The whole cost, exclusive of equipment, will be about £23,000.—At the annual meeting of the Liverpool Hospital for Consumption and Diseases of the Chest, it was stated that the Torpenhow open-air school for children at Frankby, Wirral, is "practically a new effort to tackle consumption at its source." In a country house overlooking the Dee 50 potential consumptives, boys and girls, are having six months' schooling under medical supervision. Last year 165 children received the benefits of the school, and in no single case has a scholar fallen back.

100 adults were more sophisticated and 26 complained of fatigue.

The pet dislikes of my subjects were interesting in connexion with psychical fatigue: 10 adults disliked love scenes; only 3 children actively expressed dislike. A stay-at-home population dislikes foreigners, and 17 people bitterly hated Americanisms. Seventeen children complained of blurred sound in the talkies. Other dislikes specially specified included murder (7), wild west scenes (7), comics (7), sentiment (8), bad acting (3), jazz (4), vocal quartets (2), instruction, war, religion 1 each.

These reasoned dislikes were not so interesting as the instances of morbid fears. One man was in a fever of apprehension at the pictures lest he might see blood shed; a boy was terrified of shooting; a man seldom went to the pictures as he once heard a child scream in the audience; a lady feared murder films as she dreamed and had nightmares; a man felt that when at the pictures he was surrounded by the offscourings of the gutters and wanted to get out of the crowd.

I have emphasised the minor psychical abnormalities of a few of my subjects, but on the whole my investigations showed the extraordinary commonsense and tolerance of the London masses.

Flicker.

The optimum-rate of projection of a film is often said to be 16 pictures a second with a duration of 1/32 second per picture. In fact, the most smoothly moving pictures are run at about 25–30 pictures per second. If the film is run too slowly, flicker is produced. Large picture houses run their films at 5000 feet per hour. Smaller theatres wishing to reduce renting costs of their film programmes may run films at 4000 feet per hour or even slower. If the slowing is excessive, flicker may be produced. Such flicker may be somewhat minimised by the use of a revolving, interrupted shutter with accessory vanes.

The film runs through the projector in a series of intermittent jerks, the intermittent motion being due to a device known as a "Maltese cross." Teeth fit into perforations along the sides of the film and pull it through the machine in jerks. Formerly irregularities in the perforations were a common source of trouble but modern film manufacture has improved this defect. Mr. G. B. Bowell maintains that a source of "eyestrain" still remains in the elasticity of the film. The intermittent movement makes the film alternately stretch and relax so that it is never quite stationary at the moment of projection.

Another cause of flicker is the use of alternating current for the arc light which projects the film on the screen. Variations in light intensity may produce flicker. Direct current should be obtained by using a transformer if only alternating current is supplied at the mains.

Vibration.

Vibration of the picture projected is another very trying phenomenon. Lateral and vertical movements may occur from loosening of the "gates" or grooves through which the film runs in the projectors. This is especially trying when printed captions are thrown upon the screen. Projectors should be firmly anchored to the floor or the projector motor may cause vibration. Projector motors should be run off the special power circuit and not the lighting circuit.

"Rain."

"Rain" or floating spots on the projected picture may annoy the audience. "Rain" has various causes. Film is used over and over again, starting at the larger houses and descending in due course to the barns and tin shacks used as country picture theatres. The film inevitably gets scratched and the scratches projected cause "rain." When celluloid film is run fast through projectors, static electricity is generated, and this attracts dust, which shows as "rain" on the screen. In theory the film [illegible] houses are supposed to clean used film; duty is often discharged in a perfunctory Old film often catches in the projector and the tears out the offending segment. The film i sequently stuck together with some missing, omission of the intervening piece causes discontinuity at subsequent projections. film should be discarded.

"Dazzle."

"Dazzle" is another ill-effect of which often complain. Here the individual is very variable and is much increased by suc diseases as conjunctivitis. Every film needs a minimum amount of light for optimum. Animated black-and-white cartoons such as of Mickey Mouse require some dimming of th jector light to avoid unpleasant glare. On the hand, colour films require more light and more projection than the normal. The front of the is undoubtedly the worst place for those to dazzle, which worried the musicians in the of a large cinema very much until they were with tinted glasses.

The eyes of an audience take some time used to changes of light in the intervals films. On this account all the lighting of the torium should be fitted with dimming apparatu the lights turned on and off gradually, not

Bad Vision and Excessive Concentrati

Uncorrected errors of refraction produced fatigue in those persons who attempted to see by narrowing their palpebral fissures or by accommodation. Refractive errors in themselv not necessarily seem to cause fatigue. children with refractive errors and atropinise were sent to the cinema but they experience discomfort save not seeing clearly. In my ow I found fatigue in watching colour films due to excessive accommodation. This was demonstrated by watching a colour film in red and blue-green tints predominated. The the normal eye focuses blue-green sharply in of the retina, while red images tend to focus at an imaginary point just behind the retina own eyes are very slightly hypermetropic. watching a blue-green and red colour film I a tended to focus the blue-green most sharply images of this colour became blurred and red became progressively sharply focused. This menon, the basis of the well-known refraction test, showed I was getting a accommodation and at the same time I expe headache. Perhaps my knowledge of the menon made me look for it and there may be alternative explanation such as "suggestion." patients experienced much relief from fatigue cinema after their refractive errors were

Effects of Distance.

Many patients said that sitting too near screen worried their eyes. The head had to be to an uncomfortable angle in order to see. and dazzle were more noticeable near to the Statistical information was difficult as the c a seat was complicated by financial factors in cases. Of 200 consecutively interviewed 27·5 per cent. habitually sat at the back, 62 per in the middle, and 10·5 per cent. in front. people complaining of cinema discomfort, 2 cent. sat at the back, 48 per cent. in the m 24 per cent. in front. These percentages ar based upon large enough numbers to draw clusions. A cinema proprietor with whom I t thought distance had a great effect on fatigue interspersed films with variety turns which popular because the people in the front temporarily exchanged the worst seats in the for the best.

Uncomfortable Seats.

Uncomfortable seats are becoming rariti modern cinemas which have much in this